

# A Five Dimensional Model of Executive Function: Cognition, Behavior, Social-Emotional, Academics, & Impairment!

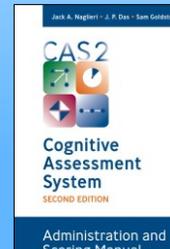
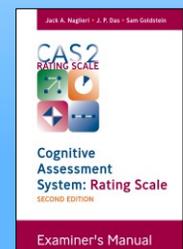
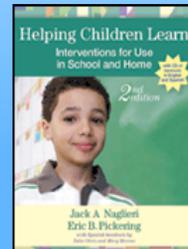
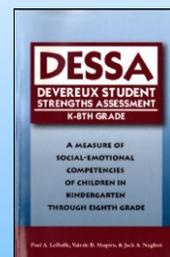
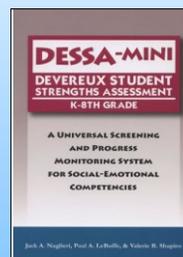
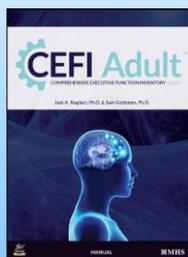
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conclusions

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## Resources and Disclosures



conclusions

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# www.jacknaglieri.com

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

## Want to Learn More... Join us in California July 9-13, 2018

## My Background

- Interest in intelligence and instruction
- Experience
  - Need
  - Psych
  - Evid
- My personal research
- Why t



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## Today's Session

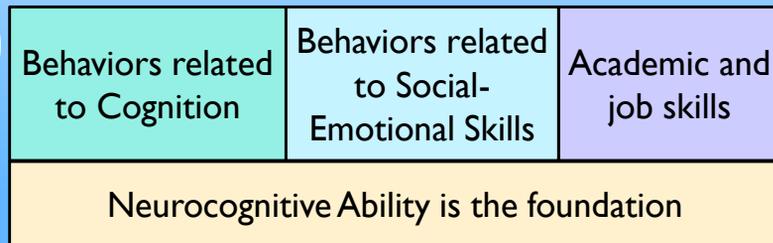
- Introduce yourself to your neighbors
  - We will be discussing various topics today and you need to know who your talking to
    - Name (write it down so you remember)
    - What they do
    - Share a something about yourself relative to EF
- Establish roles:
  - Coach
  - Organizer (keeps time)
  - Recorder and Spokesperson
  - Energizer

conclusions

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## Goal of this presentation

A comprehensive approach to understanding and assessing EF needs to include several conceptual areas.



conclusions

## 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
  - Impairment and EF
  - 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

conclusions

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## EF Lesson on Saturday Night Live

- We will begin by learning about how EF can be encouraged, using one of the lessons in *www.efintheclassroom.net* curriculum
- 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

conclusions

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## EF Lesson on Saturday Night Live



conclusions

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## 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

conclusions

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## Time to Think and Talk

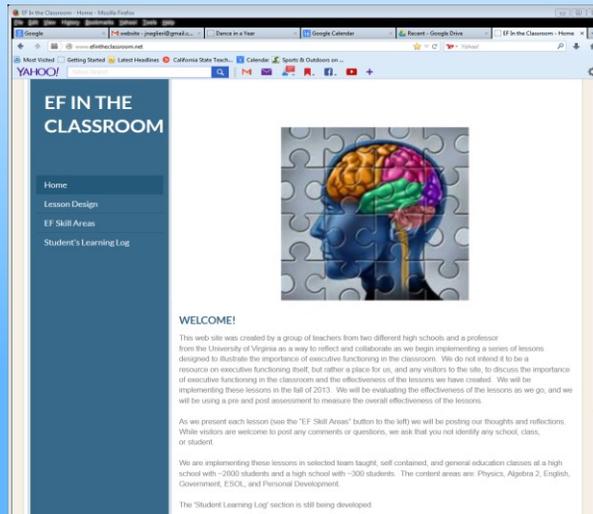
- **Task:**
- Talk with your partner(s)
- What was the main point ?
- Was the goal achieved ?
- Why was it so hard to get the students to think?
- Your own questions and thoughts..


 START


 4  
minutes  
left


conclusions

## All Lessons available at: [www.efintheclassroom.net](http://www.efintheclassroom.net)



conclusions

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## 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

conclusions

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## 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'

conclusions

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## History Class: Saturday Night Live

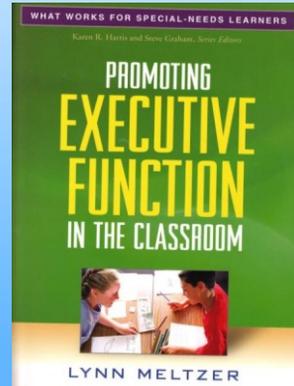
- Teach students to think not just remember
- How to learn is just as important as what to learn
- This is what Executive Function is all about
- This is the theme of today's workshop

conclusions

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## 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’.



conclusions

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## 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 student’s life

conclusions

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## Executive Function Goals

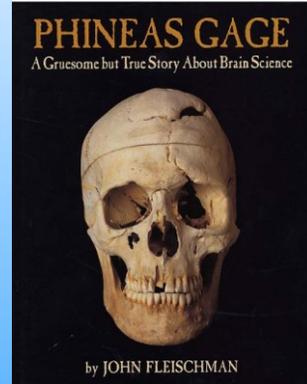
- Today we will be *thinking about thinking*
- I will be teaching you *how* to help people learn to do the things they want to do
- The goal is to help students learn more by *encouraging them consider how they do what they decide to do*
- The goal is to engage the frontal lobes

## 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
- Impairment and EF
- 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

## 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.

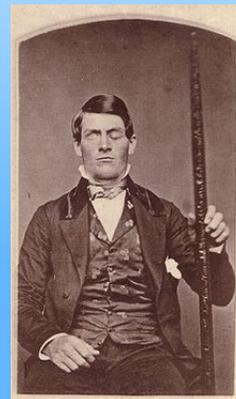


conclusions

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## The Curious Story of Phineas Gage

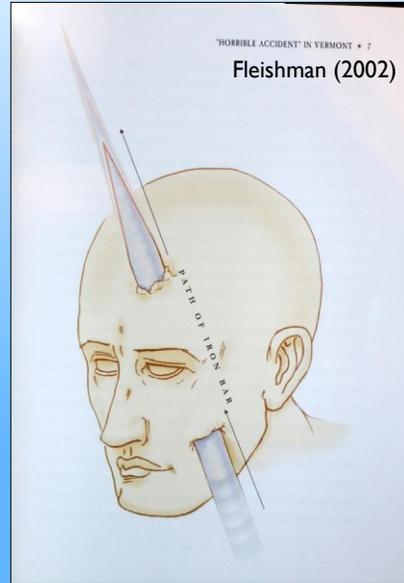
- September 13, 1848 26 year old Phineas Gage was in charge of a railroad track construction crew blasting granite bedrock near Cavendish, Vermont
- The job Phineas has is to use a "tamping iron" to set explosives
- The tamping iron is a rod about 3 ½ feet long weighing 13 ½ lbs pointed at one end



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## 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

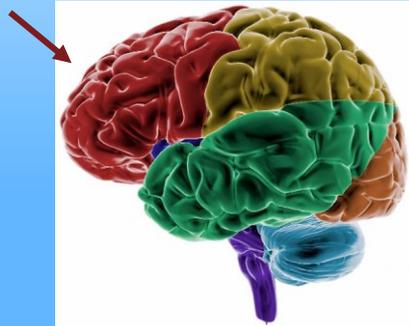


## Before . . . & . . . After

- **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.

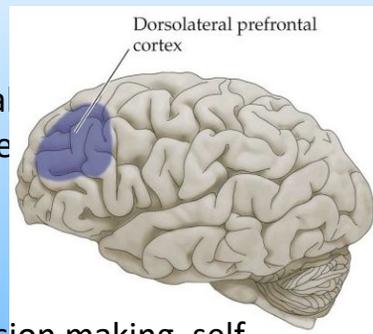


conclusions

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## 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.



conclusions

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## The Curious Story of Phineas Gage

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



The skull of Phineas Gage

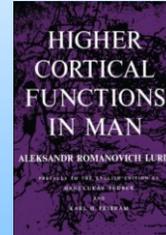
The skull of Phineas Gage, along with the tamping iron which did the damage. On display at Harvard's Warren Anatomical Museum.

## Frontal Lobes and Executive Function(s)

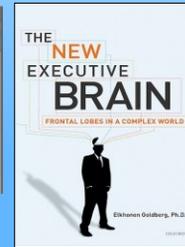
What do we mean by the term Executive Function(s)?

## Executive Functions

- In 1966 Luria first wrote and defined the concept of Executive Function (EF)



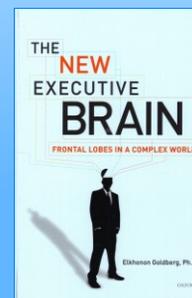
- Elkhonon Goldberg provides a valuable review of what the frontal lobes do
- Describes EF as the orchestra leader



conclusions

## Goldberg (2009, p. 4)

- “The frontal lobes ... are related 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...”



conclusion: 32

## What is Executive Function(s)

There is no formal accepted 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 lobes.
- We found more than 30 definitions of EF(s)



## Executive Function

- EF is a **unitary** construct (Duncan & Miller, 2002; Duncan & Owen, 2000).
- EF is **unidimensional** in early childhood not adulthood.
- Both views are supported by some research (Miyake et al., 2000) EF is a **unitary construct ... but with partially different components.**

## Executive Functions

- 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).

conclusions

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## Executive Function(s)

- Given all these definitions of EF(s) we wanted to address the question...  
Executive Functions **s** ... or  
Executive Function?
- One way to answer the question is to research the factor structure of EF behaviors
- Factor structure of the Comprehensive Executive Function Inventory (CEFI)

conclusions

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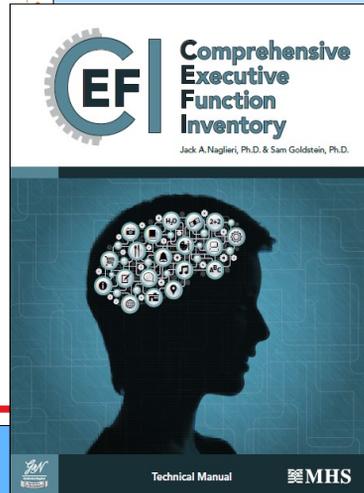
# CEFI (Naglieri & Goldstein, 2012)

**CEFI Comprehensive Executive Function Inventory**

**(5-18 Years) TEACHER FORM**  
Jack A. Naglieri, Ph.D. & Sam Goldstein, Ph.D.

Client's Name/ID: \_\_\_\_\_ Today's Date: \_\_\_\_\_  
 Gender: M / F \_\_\_\_\_ Birth Date: \_\_\_\_\_  
 Grade: \_\_\_\_\_ Age: \_\_\_\_\_  
 Teacher's Name/ID: \_\_\_\_\_ Class(es) Taught: \_\_\_\_\_  
 School: \_\_\_\_\_ Time Known Child: \_\_\_\_\_  
 Examiner: \_\_\_\_\_

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# CEFI Adult (Naglieri & Goldstein, 2017)

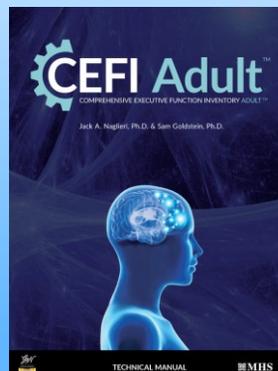
**CEFI Adult**

Jack A. Naglieri, Ph.D. & Sam Goldstein, Ph.D.

**Observer Form**

Client's Name/ID: \_\_\_\_\_ Today's Date: \_\_\_\_\_  
 Gender: \_\_\_\_\_ Birth Date: \_\_\_\_\_  
 Observer's Name/ID: \_\_\_\_\_ Age: \_\_\_\_\_  
 Relationship to Client: \_\_\_\_\_ Time Known Client: \_\_\_\_\_  
 Examiner: \_\_\_\_\_

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conclusions

## Exploratory Factor Analysis

➤ The normative samples for parent, 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 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          | 1. Consistency Index   |
| 2. Emotion Regulation | 2. Negative Impression |
| 3. Flexibility        | 3. Positive Impression |
| 4. Inhibitory Control |                        |
| 5. Initiation         |                        |
| 6. Organization       |                        |
| 7. Planning           |                        |
| 8. Self-Monitoring    |                        |
| 9. 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

conclusions

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## Factor Analysis

### ➤ Item Level Analysis

- For the **first half** of the normative sample (Parent, Teacher and Self ratings') **item scores** (90 items) used in factor analysis

### ➤ Scale Level Analysis

- Using the **second half** of the normative sample EFA was conducted using raw scores by scale:
  - Attention
  - Emotion Regulation
  - Flexibility
  - Inhibitory Control
  - Initiation
  - Organization
  - Planning
  - Self-Monitoring
  - Working Memory

conclusions

## 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/<br>Ethnic<br>Group | Parent      | .996                      |
|                          | Teacher     | .999                      |
|                          | Self-Report | .995                      |
| Age                      | Parent      | .999                      |
|                          | Teacher     | .999                      |
|                          | Self-Report | .995                      |
| Clinical/<br>Educational | Parent      | .993                      |
|                          | Teacher     | .994                      |
|                          | Self-Report | .976                      |

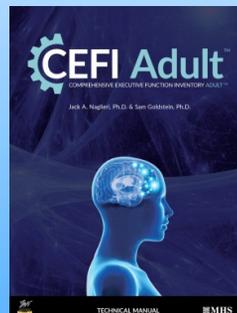
**Nearly identical factor solutions (ALL ONE FACTOR) by Gender, Race/Ethnic, Age and Clinical/typical status**

conclusions

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## Factor Analysis of the CEFI Adult

- Same scale structure as CEFI
- Full Scale
  - Attention
  - Emotion Regulation
  - Flexibility
  - Inhibitory Control
  - Initiation
  - Organization
  - Planning
  - Self-Monitoring
  - Working Memory



conclusions

## Consistency of Loadings

### Consistency of Factor Loadings Across Groups

Exploratory factor analysis (EFA) was used to examine the replicability of the unidimensional factor structure of the CEFI Adult across several demographic groups (gender, age, race/ethnicity, and clinical status). The EFA procedure was conducted for each demographic group to determine if the factor structure was consistent across genders (males vs. females), ages (below vs. at or above the normative mean of 50), race/ethnicity (broken down into White vs. non-White to allow large enough sample sizes to detect differences), and clinical status (non-clinical vs. clinical). The factor loadings of the items were correlated across groups to compute the coefficient of congruence (Abdi, 2010); results revealed a very high degree of consistency across all groups (see Table 8.6), indicating that the unidimensionality of the CEFI Adult generalized across the demographic groups.

Consistency of Factor Loadings Across Groups

| Grouping Factor     | CEFI Adult Form | Coefficient of Congruence | Group 1        |       | Group 2   |     |
|---------------------|-----------------|---------------------------|----------------|-------|-----------|-----|
|                     |                 |                           | Level          | N     | Level     | N   |
| Gender              | Self-Report     | .998                      | Male           | 795   | Female    | 865 |
|                     | Observer        | .999                      | Male           | 795   | Female    | 865 |
| Racial/Ethnic Group | Self-Report     | .997                      | White          | 1,153 | Non-white | 507 |
|                     | Observer        | .999                      | White          | 1,154 | Non-white | 506 |
| Age                 | Self-Report     | .997                      | Under 50 years | 840   | 50+ years | 820 |
|                     | Observer        | .999                      | Under 50 years | 840   | 50+ years | 820 |
| Clinical Status     | Self-Report     | .993                      | Non-clinical   | 1,501 | Clinical  | 159 |
|                     | Observer        | .996                      | Non-clinical   | 1,497 | Clinical  | 163 |

conclusions

## EXPLORATORY FACTOR ANALYSES

### ➤ Conclusions

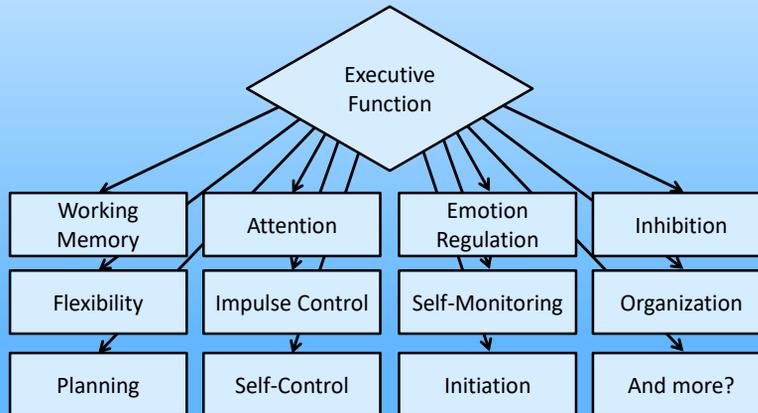
- CEFI: Parent (N=1,400), Teacher (N=1,400) and Self (N=700),
- CEFI Adult: Self (N = 1,600) and Observer (N = 1,600) ratings
- From nationally representative samples aged 5 to 80 years (N = 6,700) indicates .. Executive Function best describes the concept

conclusions

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## EF and its components

- Abilities, cognitive processes, and behaviors

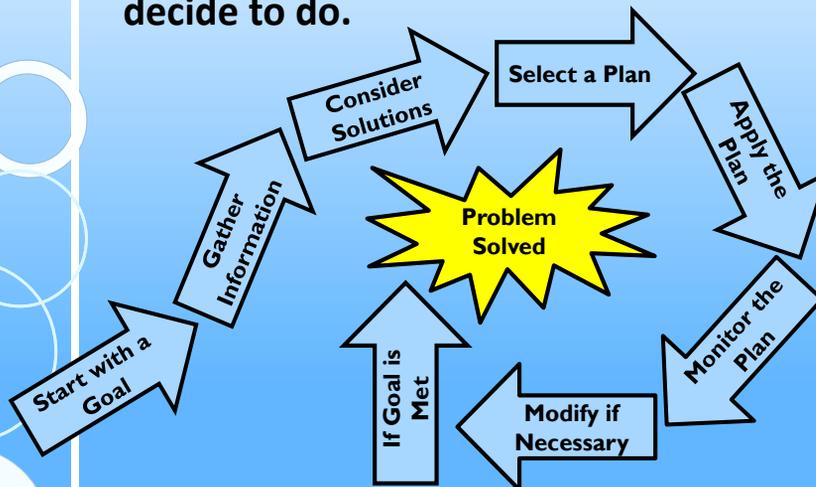


conclusions

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## Naglieri & Goldstein, 2012

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



conclusions

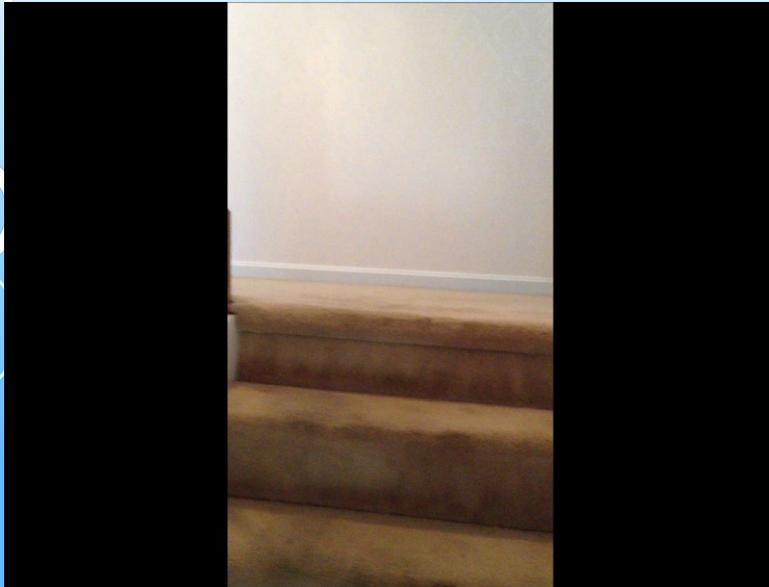
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## Does a 13 month old have EF?



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## Age 19 months: Knowledge & EF

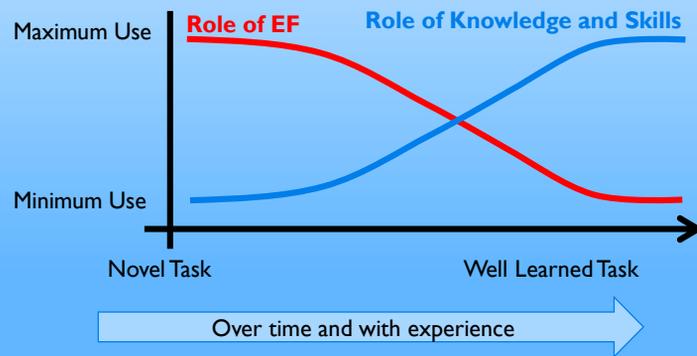
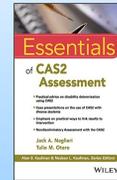


conclusions

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## EF's Learning Curves (Naglieri & Otero, 2017)

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



conclusions

## 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.

conclusions

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**Which  
Lemming  
has good  
EF?**



conclusions

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**EF: ability, behavior, social-  
emotional skill?**

All are reflections of **FRONTAL LOBE** activity

conclusions

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## 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* and *Emotion* because they may be different

conclusions

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## Presentation Outline

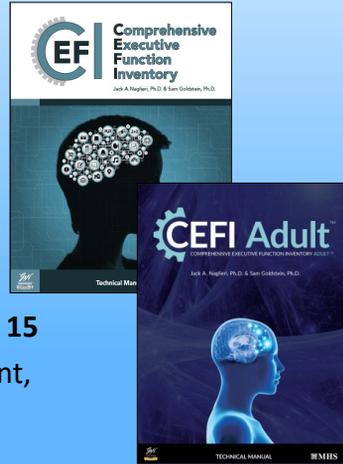
- Comprehensive Model of EF
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- **Think Smart!** -- EF Skills in the Classroom
  - More lesson plans for improving components of EF
- Conclusions

conclusions

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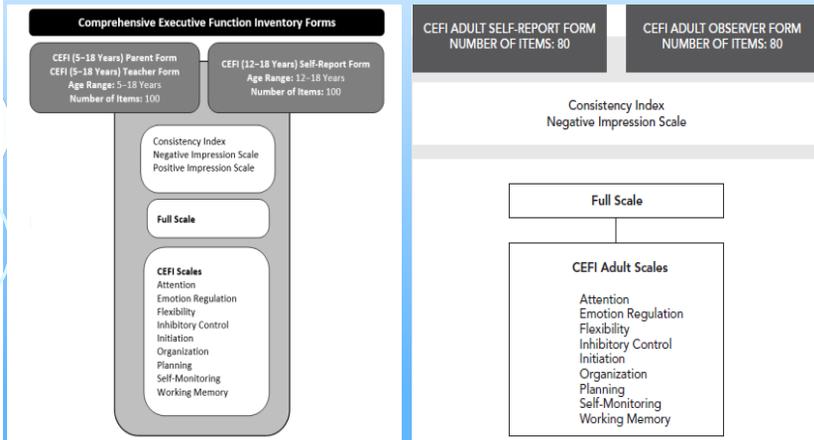
# Comprehensive Executive Function Inventory - CEFI and CEFI Adult

- CEFI is a **strength based** EF measure
- Items are **positively** worded
- Higher scores = **good** behaviors related to EF
- Scores set at mean of **100** SD of **15**
- Ages 5-18 years rated by a parent, teacher, or the child/youth.



conclusions 57

## CEFI & CEFI-Adult Scales



conclusions

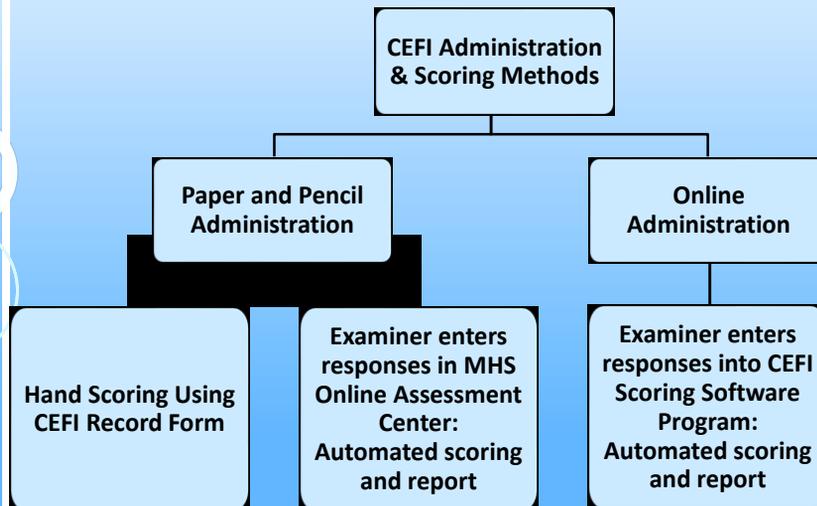
## CEFI Normative Samples

- 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

conclusions

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## CEFI Administration & Scoring



conclusions

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## CEFI Forms and Scales

**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. <b>Attention</b>          | 1. <b>Consistency Index</b>   |
| 2. <b>Emotion Regulation</b> | 2. <b>Negative Impression</b> |
| 3. <b>Flexibility</b>        | 3. <b>Positive Impression</b> |
| 4. <b>Inhibitory Control</b> |                               |
| 5. <b>Initiation</b>         |                               |
| 6. <b>Organization</b>       |                               |
| 7. <b>Planning</b>           |                               |
| 8. <b>Self-Monitoring</b>    |                               |
| 9. <b>Working Memory</b>     |                               |

conclusions

## CEFI Forms

- Each 100-item form yields scales set at a mean of 100 and SD of 15

**English  
Parent  
Form (5-18  
years)**

**English  
Teacher  
Form (5-18  
years)**

**English Self-  
Report  
Form (12-18  
years)**

**Spanish  
Parent  
Form (5-18  
years)**

**Spanish  
Teacher  
Form (5-18  
years)**

**Spanish  
Self-Report  
Form (12-18  
years)**

conclusions

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## CEFI Forms

Each form yields a **Full Scale** score and 9 separate content scales which contain items as follows...

### CEFI Scales

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

conclusions

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## CEFI Items by Scale

**Table C.4. Attention (12 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 3.     | finish a boring task?                                                             | finish a boring task?                                                    |
| 11.    | work well in a noisy environment?                                                 | work well in a noisy environment?                                        |
| 21.    | work well for a long time?                                                        | work well for a long time?                                               |

**Table C.5. Emotion Regulation (9 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 10.    | control emotions when under stress?                                               | control emotions when under stress?                                      |
| 12.    | stay calm when handling small problems?                                           | stay calm when handling small problems?                                  |
| 42.    | find it hard to control his/her emotions? (R)                                     | find it hard to control your emotions? (R)                               |

**Table C.6. Flexibility (7 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 7.     | come up with a new way to reach a goal?                                           | come up with a new way to reach a goal?                                  |
| 41.    | come up with different ways to solve problems?                                    | come up with different ways to solve problems?                           |
| 45.    | have many ideas about how to do things?                                           | have many ideas about how to do things?                                  |

conclusions

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## CEFI Items by Scale

**Table C.7. Inhibitory Control (10 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1.     | think before acting?                                                              | think before acting?                                                     |
| 19.    | find it hard to control his/her actions? (R)                                      | find it hard to control your actions? (R)                                |
| 32.    | think of the consequences before acting?                                          | think of the consequences before acting?                                 |

**Table C.8. Initiation (10 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 16.    | start something without being asked?                                              | start something without being asked?                                     |
| 30.    | start conversations?                                                              | start conversations?                                                     |
| 39.    | take on new projects?                                                             | take on new projects?                                                    |

**Table C.9. Organization (10 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 5.     | complete one task before starting a new one?                                      | complete one task before starting a new one?                             |
| 13.    | organize his/her thoughts well?                                                   | organize your thoughts well?                                             |
| 18.    | appear disorganized? (R)                                                          | appear disorganized? (R)                                                 |

conclusions

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## CEFI Items by Scale

**Table C.10. Planning (11 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 9.     | prepare for school or work?                                                       | prepare for school or work?                                              |
| 15.    | solve problems creatively?                                                        | solve problems creatively?                                               |
| 22.    | do things in the right order?                                                     | do things in the right order?                                            |
| 28.    | plan for future events?                                                           | plan for future events?                                                  |

**Table C.11. Self-Monitoring (10 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 6.     | ask for help when needed?                                                         | ask for help when needed?                                                |
| 14.    | fix his/her mistakes?                                                             | fix your mistakes?                                                       |
| 17.    | change a plan that was not working?                                               | change a plan that was not working?                                      |
| 29.    | learn from past mistakes?                                                         | learn from past mistakes?                                                |

**Table C.12. Working Memory (11 items)**

| Item # | Parent/Teacher Item<br><i>During the past 4 weeks, how often did the child...</i> | Self-Report Item<br><i>During the past 4 weeks, how often did you...</i> |
|--------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 4.     | forget instructions? (R)                                                          | forget instructions? (R)                                                 |
| 8.     | remember how to do something?                                                     | remember how to do something?                                            |
| 23.    | forget instructions with many steps? (R)                                          | forget instructions with many steps? (R)                                 |
| 26.    | remember many things at one time?                                                 | remember many things at one time?                                        |

## One Factor and 9 Scales?

- NOTE: EF is a unidimensional concept
- Use the Full Scale to answer the question “Is the child poor in EF or not?”
- Use the 9 scales to identify the specific groups of items that represent 9 different types of behaviors that can be addressed by Intervention

### CEFI Scales

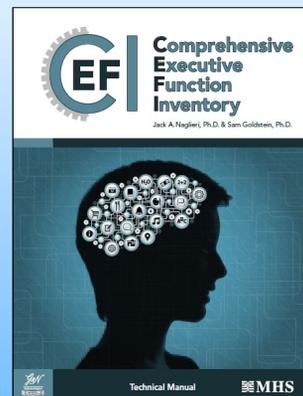
Attention  
 Emotion Regulation  
 Flexibility  
 Inhibitory Control  
 Initiation  
 Organization  
 Planning  
 Self-Monitoring  
 Working Memory

conclusions

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## CEFI Characteristics

- Automated scoring and reporting includes intervention suggestions
- Scores are based on nationally representative normative sample that is representative of the US



conclusions

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# CEFI Full Scale and Treatment Scores

Figure 4.1. Illustration of Executive Function Weakness and Strengths on the CEFI (5–18 Years) Teacher Form

| CEFI Scales             | Standard Score | Difference From Youth's Average | Statistically Significant? (Yes/No) | Executive Function Strength/Weakness | 90%/95% (circle one) Confidence Interval | Percentile Rank | Classification |
|-------------------------|----------------|---------------------------------|-------------------------------------|--------------------------------------|------------------------------------------|-----------------|----------------|
| Attention (AT)          | 95             | -6.7                            | Yes                                 | —                                    | <u>90</u> to <u>100</u>                  | 37              | Average        |
| Emotion Regulation (ER) | 82             | -19.7                           | Yes                                 | Weakness                             | <u>77</u> to <u>90</u>                   | 12              | Low Average    |
| Flexibility (FX)        | 112            | 10.3                            | Yes                                 | Strength                             | <u>103</u> to <u>118</u>                 | 79              | High Average   |
| Inhibitory Control (IC) | 99             | -2.7                            | No                                  |                                      | <u>93</u> to <u>105</u>                  | 47              | Average        |
| Initiation (IT)         | 120            | 18.3                            | Yes                                 | Strength                             | <u>112</u> to <u>125</u>                 | 91              | Superior       |
| Organization (OG)       | 99             | -2.7                            | No                                  |                                      | <u>93</u> to <u>105</u>                  | 47              | Average        |
| Planning (PL)           | 101            | -0.7                            | No                                  |                                      | <u>96</u> to <u>106</u>                  | 53              | Average        |
| Self-Monitoring (SM)    | 102            | 0.3                             | No                                  |                                      | <u>95</u> to <u>109</u>                  | 55              | Average        |
| Working Memory (WM)     | 105            | 3.3                             | No                                  |                                      | <u>99</u> to <u>111</u>                  | 63              | Average        |
| Sum of Standard Scores  | 915            | 101.7                           | Youth's Average                     |                                      |                                          |                 |                |

Note. Differences from the Child's/Youth's Average are significant at  $p < .10$ .

Free Use of CEFI:  
<http://info.mhs.com/cefi>



## Comprehensive Executive Function Inventory™ - CEFI®



**Learn More**  
 If you are interested in learning more about the CEFI, fill out the form to request information like:

- How this instrument compares to others
- Progress Monitoring
- Intervention Strategies
- View case studies, sample reports or items
- How to use an instrument
- Setting up trainings
- Further questions or comments

### I would like to ...

- Learn more about: (Check all that Apply)
- Theoretical support for model
  - How this assessment compares to other assessments
  - Psychometric Properties
  - Reliability and Validity
  - The Authors
  - Speaking with the consultant
  - Participate in Data Collection Opportunities
  - Other (Please specify in Comments)

- I would like to: (Check all that Apply)
- Try it Online For Free
  - Speak with a Consultant
  - Set Up Training
  - Other (Please specify in Comments)

First Name \*  Last Name \*

I am a \_\_\_ and I work in a \_\_\_ \*  
 - Please Select -

School District/Organization \*

Email \*  Phone Number \*

Preferred Contact Method \*  
 Phone  
 Email

Country \*  
 - Please Select -

State/Region \*  City \*

- Please Select -

I would like to receive email communications on MHS assessments, discounts, workshops, training, data collection opportunities, and surveys. You can unsubscribe at anytime.

Yes  
 Comments/Questions

Submit

## Free Use of CEFI: mhs.com/cefi

Comprehensive Executive Function Inventory™ - CEFI - Mozilla Firefox

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If you are interested in learning more about the CEFI, fill out the form to request information like:

- How this instrument compares to others
- Progress Monitoring
- Intervention Strategies
- View case studies, sample reports or items
- How to use an instrument
- Setting up trainings
- Further questions or comments

I would like to: (Check all that Apply)

- View Samples Items
- View Sample Reports
- View Case Studies
- Speak with a Consultant
- Set Up Training

First Name \*

Last Name \*

I am a \_\_\_ and I work in a \_\_\_: \*

- Please Select -

School District/Organization \*

Email \*

Phone Number \*

Preferred Contact Method \*



## CEFI Scale Reliability

### CEFI Internal Reliability Coefficients for the Normative Sample

|                           | Parent (N = 1,396) | Teacher (N=1,400) | Self (N = 700) |
|---------------------------|--------------------|-------------------|----------------|
| <b>Full Scale</b>         | <b>.99</b>         | <b>.99</b>        | <b>.97</b>     |
| <b>Attention</b>          | <b>.93</b>         | <b>.96</b>        | <b>.86</b>     |
| <b>Emotion Regulation</b> | <b>.89</b>         | <b>.93</b>        | <b>.78</b>     |
| <b>Flexibility</b>        | <b>.85</b>         | <b>.90</b>        | <b>.77</b>     |
| <b>Inhibitory Control</b> | <b>.90</b>         | <b>.94</b>        | <b>.80</b>     |
| <b>Initiation</b>         | <b>.89</b>         | <b>.93</b>        | <b>.80</b>     |
| <b>Organization</b>       | <b>.91</b>         | <b>.94</b>        | <b>.85</b>     |
| <b>Planning</b>           | <b>.92</b>         | <b>.96</b>        | <b>.85</b>     |
| <b>Self-Monitoring</b>    | <b>.87</b>         | <b>.92</b>        | <b>.78</b>     |
| <b>Working Memory</b>     | <b>.89</b>         | <b>.94</b>        | <b>.83</b>     |

## CEFI Interpretation

- Step 1: Examine Quality of the Ratings:  
Consistency, Positive and Negative  
Impression
- Step 2: Interpret Scale Scores
- Step 3: Compare CEFI Scale Scores
- Step 4: Examine Item-Level Responses
- Step 5: Compare Results Across Raters
- Step 6: Compare Results Over Time

conclusions

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## Step 1: Consistency Index

- The Consistency Index provides information about whether the rater responded to similar items differently.
- Inconsistent responding can occur intentionally or unintentionally, and could be due to deliberate non-compliance, fatigue, a misunderstanding of the items or instructions, inattention, disinterest, or a lack of motivation

conclusions

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## Step 1: Impression Scales

- The Negative Impression scale evaluates the likelihood that the rater underestimated the individual's functioning.
- The Positive Impression scale evaluates the likelihood that the rater overestimated the individual's functioning.

conclusions

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## Step 1: Impression Scales

- A particular response style is indicated if the standard score is less than 76 (< 5% of the normative sample).

| Scale                     | Interpretive Text                                                                                                                     |                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
|                           | Standard Score ≤ 75                                                                                                                   | Standard Score > 75                                       |
| Consistency Index         | The rater responded in a different way to similar items. This rating pattern is not typical and should be further investigated.       | The pattern of ratings is typical.                        |
| Negative Impression Scale | The pattern of ratings may underestimate the child's behavior. This rating pattern is not typical and should be further investigated. | The pattern of ratings is typical.                        |
| Positive Impression Scale | The pattern of ratings may overestimate the child's behavior. This rating pattern is not typical and should be further investigated.  | The pattern of ratings is typical.                        |
| Time to Completion        | The rater spent considerably less time than is usual completing the CEFI.                                                             | The time the rater took to complete the CEFI was typical. |

**Time to Completion is only for online administration**

# CEFI Interpretive Report



**Comprehensive  
Executive  
Function  
Inventory**



(5–18 Years)  
Parent Form

Jack A. Naglieri, Ph.D. & Sam Goldstein, Ph.D.

## Interpretive Report

**Youth's Name/ID:** Brittany Ambers

Age: 12 years  
 Gender: Female  
 Birth Date: November 18, 1999  
 Grade: 6  
 School: K. H. S.  
 Parent's Name/ID: Mrs. Z  
 Relationship to Youth: Mother  
 Administration Date: May 19, 2012  
 Examiner: DH  
 Data Entered By: MT

conclusions

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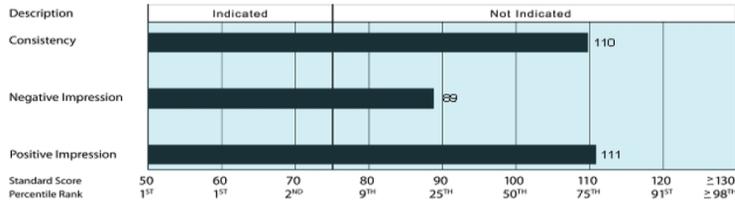
# CEFI Interpretive Report

CEFI (5–18 Years) Parent Interpretive Report for Brittany Ambers

Admin Date: 05/19/2012

## About the Ratings

This section of the report provides an evaluation of the ratings provided by this rater. Item scores were examined for consistency, negative impression, positive impression, and number of omitted items. This information can be used to determine whether responses should be reviewed with the rater to explore possible reasons response bias is indicated, and the amount of confidence one can have in the scores.



## Scores

|                                  |                                                                              |
|----------------------------------|------------------------------------------------------------------------------|
| <b>Consistency Index</b>         | Standard Score = 110<br>Inconsistent response style is not indicated.        |
| <b>Negative Impression Scale</b> | Standard Score = 89<br>Negative impression response style is not indicated.  |
| <b>Positive Impression Scale</b> | Standard Score = 111<br>Positive impression response style is not indicated. |
| <b>Number of Omitted Items</b>   | Number of Items Omitted = 0<br>None of the items were omitted.               |

conclusions

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## CEFI Interpretation

- Step 1: Examine Quality of the ratings:  
Consistency, Positive and Negative Impression
- Step 2: Interpret Scale Scores
- Step 3: Compare CEFI Scale Scores
- Step 4: Examine Item-Level Responses
- Step 5: Compare Results Across Raters
- Step 6: Compare Results Over Time

conclusions

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## Step 2: Interpret Scale Scores

- All scales are set at mean of 100, SD of 15
- Low scores mean poor EF

Table 4.3. Interpretation Guidelines for Examining Scale Scores

| Scale              | Interpretation Guidelines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Full Scale         | Reflects overall executive function. The Full Scale score is made up of 90 items from nine different areas that are conceptually related to executive function (i.e., Attention, Emotion Regulation, Flexibility, Inhibitory Control, Initiation, Organization, Planning, Self-Monitoring, and Working Memory). The CEFI Scales describe the content of the items for intervention purposes. If there is significant variation among the CEFI Scales, the Full Scale score will sometimes be higher and other times lower than scores on these scales. However, the Full Scale score is a good description of a child's/youth's executive function behaviors if there is no significant variation among the CEFI Scales. |
| Attention          | Describes how well a child/youth can avoid distractions, concentrate on tasks, and sustain attention.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Emotion Regulation | Indicates the child's/youth's control and management of emotions, including staying calm when handling small problems and reacting with the right level of emotion.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Flexibility        | Reflects a child's/youth's skill at adjusting behavior to meet circumstances, including coming up with different ways to solve problems, having many ideas about how to do things, and being able to solve problems using different approaches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

# CEFI Interpretive Report

CEFI (5–18 Years) Parent Interpretive Report for Brittany Ambers

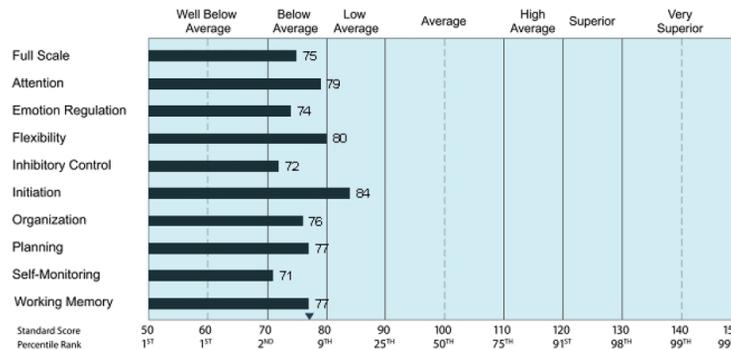
Admin Date: 05/19/2012

## Overview of Results for Brittany Ambers

### Scores in Relation to the Norm

Brittany Ambers's results are provided in the graph below.

▼ Youth's Average



conclusions

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# CEFI Interpretive Report

CEFI (5–18 Years) Parent Interpretive Report for Brittany Ambers

Admin Date: 05/19/2012

## CEFI Results

Brittany Ambers's **Full Scale** standard score of 75 falls in the *Below Average* range and is ranked at the 5th percentile. This means that her score is equal to, or greater than, 5% of those obtained by youth her age in the standardization group. There is a 90% probability that Brittany Ambers's true Full Scale standard score is within the range of 73 to 78. The CEFI Full Scale score is made up of items that belong on separate scales called Attention, Emotion Regulation, Flexibility, Inhibitory Control, Initiation, Organization, Planning, Self-Monitoring, and Working Memory. There was no significant variation among the CEFI Scales. This indicates that Brittany Ambers obtained similar scores on the separate scales. This also means that the Full Scale is a good description of her executive function behaviors.

Brittany Ambers's **Initiation** scale score describes how she begins tasks or projects on her own, including starting tasks easily, being motivated, and taking the initiative when needed. Her standard score of 84 falls in the *Low Average* range and is ranked at the 14th percentile. There is a 90% probability that her true Initiation standard score is within the range of 78 to 93. Item score variability suggests that ratings for Brittany Ambers were low on, for example, initiating conversations and putting plans into action.

Brittany Ambers's **Flexibility** scale score describes how she adjusts her behavior to meet circumstances, including coming up with different ways to solve problems, having many ideas about how to do things, and being able to solve problems using different approaches. Her standard score of 80 falls in the *Low Average* range and is ranked at the 9th percentile. There is a 90% probability that her true Flexibility standard score is within the range of 74 to 92. Ratings for Brittany Ambers were low on, for example, using a different strategy when another doesn't work.

Brittany Ambers's **Attention** scale score reflects how well she can avoid distractions, concentrate on tasks, and sustain attention. Her standard score of 79 falls in the *Below Average* range and is ranked at the 8th percentile. There is a 90% probability that her true Attention standard score is within the range of 74 to 87. Variability in item scores indicates that ratings for Brittany Ambers were low on, for example, finishing a boring task, avoiding distraction and noticing details. (See the *CEFI Items by Scale* section of this report for additional low item scores.)

conclusions

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CEFI (12–18 Years) Self-Report Interpretive Report for Random2 Admin Date: 01/07/2

## Intervention Strategies for Attention

**Report**

Intervention Strategies are provided for each of the 9 CEFI scales

*Helping a Child Overcome Problems with Inattention*

First, help the child understand the nature of his or her attention problems, including:

- Concepts such as attention, resistance to distraction, and control of attention.
- Recognition of how attention affects daily functioning.
- Recognition that the deficit can be overcome.
- Basic elements of the control program.

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

- Promote success via small steps.
- Ensure success at school and at home.
  - Allow for oral responses to tests.
  - Circumvent reading whenever possible.
- Teach rules for approaching tasks.
  - Help the child define tasks accurately.
  - Assess the child's knowledge of problems.
  - Encourage the child to consider all possible solutions.
  - Teach the child to use a correct test strategy.
- Discourage passivity and encourage independence.
  - Do not rely too heavily on teacher-oriented approaches.
  - Require the child to take responsibility for correcting his or her own work.
  - Help the child to become more self-reliant.
- Encourage the child to avoid:
  - Excessive talking.
  - Working fast with little accuracy.
  - Giving up too easily.
  - Turning in sloppy, disorganized papers.

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

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

Naglieri, J. A., & Pickering, E. B., *Helping Children Learn: Intervention Handouts for Use at School and at Home*, Second Edition, 2010. Baltimore: Paul H. Brookes Publishing Co., Inc. [www.brookespublishing.com](http://www.brookespublishing.com). Used with the permission of the publisher.

conclusions **83**

## CEFI Interpretation

Step 1: Examine Quality of the ratings:  
Consistency, Positive and Negative  
Impression

Step 2: Interpret Scale Scores

Step 3: Compare CEFI Scale Scores

Step 4: Examine Item-Level Responses

Step 5: Compare Results Across Raters

Step 6: Compare Results Over Time

conclusions **84**

## Step 3: Compare CEFI Scale Scores

Figure 4.1. Illustration of Executive Function Weakness and Strengths on the CEFI (5–18 Years Teacher Form

| CEFI Scales             | Standard Score | Difference From Youth's Average | Statistically Significant? (Yes/No) | Executive Function Strength/Weakness | 90%/95% (circle one) Confidence Interval | Percentile Rank | Classification |
|-------------------------|----------------|---------------------------------|-------------------------------------|--------------------------------------|------------------------------------------|-----------------|----------------|
| Attention (AT)          | 95             | -6.7                            | Yes                                 | —                                    | 90 to 100                                | 37              | Average        |
| Emotion Regulation (ER) | 82             | -19.7                           | Yes                                 | Weakness                             | 77 to 90                                 | 12              | Low Average    |
| Flexibility (FX)        | 112            | 10.3                            | Yes                                 | Strength                             | 103 to 118                               | 79              | High Average   |
| Inhibitory Control (IC) | 99             | -2.7                            | No                                  |                                      | 93 to 105                                | 47              | Average        |
| Initiation (IT)         | 120            | 18.3                            | Yes                                 | Strength                             | 112 to 125                               | 91              | Superior       |
| Organization (OG)       | 99             | -2.7                            | No                                  |                                      | 93 to 105                                | 47              | Average        |
| Planning (PL)           | 101            | -0.7                            | No                                  |                                      | 96 to 106                                | 53              | Average        |
| Self-Monitoring (SM)    | 102            | 0.3                             | No                                  |                                      | 95 to 109                                | 55              | Average        |
| Working Memory (WM)     | 105            | 3.3                             | No                                  |                                      | 99 to 111                                | 63              | Average        |
| Sum of Standard Scores  | 915            | 101.7                           | Youth's Average                     |                                      |                                          |                 |                |

Note. Differences from the Child's/Youth's Average are significant at  $p < .10$ .

## CEFI Interpretation

Step 1: Examine Quality of the ratings:  
Consistency, Positive and Negative Impression

Step 2: Interpret Scale Scores

Step 3: Compare CEFI Scale Scores

Step 4: Examine Item-Level Responses

Step 5: Compare Results Across Raters

Step 6: Compare Results Over Time

## Step 5: Between Rater Comparisons

Table 4.5. Critical Values ( $p < .10$ ) Denoting Statistically Significant Differences Between

| Scale              | Parent to Parent |             | Teacher to Teacher |             | Parent to Teacher |             | Parent to Self-Report | Teacher to Self-Report |
|--------------------|------------------|-------------|--------------------|-------------|-------------------|-------------|-----------------------|------------------------|
|                    | 5-11 Years       | 12-18 Years | 5-11 Years         | 12-18 Years | 5-11 Years        | 12-18 Years | 12-18 Years           | 12-18 Years            |
| Full Scale         | 5                | 5           | 4                  | 4           | 4                 | 4           | 8                     | 5                      |
| Attention          | 10               | 10          | 7                  | 7           | 9                 | 9           | 13                    | 11                     |
| Emotion Regulation | 13               | 12          | 10                 | 10          | 11                | 11          | 15                    | 14                     |
| Flexibility        | 14               | 14          | 12                 | 12          | 13                | 13          | 15                    | 15                     |
| Inhibitory Control | 12               | 12          | 9                  | 9           | 11                | 10          | 14                    | 13                     |
| Initiation         | 13               | 12          | 10                 | 10          | 12                | 11          | 14                    | 14                     |
| Organization       | 12               | 10          | 10                 | 9           | 11                | 10          | 12                    | 12                     |
| Planning           | 11               | 10          | 8                  | 8           | 10                | 9           | 13                    | 11                     |
| Self-Monitoring    | 14               | 12          | 11                 | 11          | 13                | 11          | 15                    | 14                     |
| Working Memory     | 13               | 12          | 9                  | 9           | 11                | 11          | 11                    | 13                     |

conclusions

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## CEFI Interpretation

- Step 1: Examine Quality of the ratings:  
Consistency, Positive and Negative Impression
- Step 2: Interpret Scale Scores
- Step 3: Compare CEFI Scale Scores
- Step 4: Examine Item-Level Responses
- Step 5: Compare Results Across Raters
- Step 6: Compare Results Over Time

conclusions

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## Step 6: Compare Results Over Time

- Determine if CEFI pre post scores differ significantly – but also if the post-test standard score is in the Average range or higher

Table 4.6. Critical Values Denoting Statistically Significant Change Over Time

| Scale              | Parent Form |           |             |           | Teacher Form |           |             |           | Self-Report Form |           |
|--------------------|-------------|-----------|-------------|-----------|--------------|-----------|-------------|-----------|------------------|-----------|
|                    | 5-11 Years  |           | 12-18 Years |           | 5-11 Years   |           | 12-18 Years |           | 12-18 Years      |           |
|                    | $p < .05$   | $p < .10$ | $p < .05$   | $p < .10$ | $p < .05$    | $p < .10$ | $p < .05$   | $p < .10$ | $p < .05$        | $p < .10$ |
| Full Scale         | 6           | 5         | 5           | 5         | 4            | 4         | 4           | 4         | 8                | 6         |
| Attention          | 12          | 10        | 11          | 10        | 9            | 7         | 9           | 7         | 16               | 13        |
| Emotion Regulation | 15          | 13        | 14          | 12        | 11           | 10        | 11          | 10        | 20               | 17        |
| Flexibility        | 17          | 14        | 16          | 14        | 14           | 12        | 14          | 12        | 20               | 17        |
| Inhibitory Control | 15          | 12        | 14          | 12        | 11           | 9         | 11          | 9         | 19               | 16        |
| Initiation         | 15          | 13        | 14          | 12        | 12           | 10        | 12          | 10        | 19               | 16        |
| Organization       | 14          | 12        | 12          | 10        | 11           | 10        | 11          | 9         | 17               | 14        |
| Planning           | 13          | 11        | 12          | 10        | 10           | 8         | 9           | 8         | 17               | 14        |
| Self-Monitoring    | 17          | 14        | 14          | 12        | 13           | 11        | 12          | 11        | 20               | 17        |
| Working Memory     | 15          | 13        | 14          | 12        | 11           | 9         | 11          | 9         | 18               | 15        |

## Time to Think and Talk

- Task:
  - EF as a single concept
  - Other ideas
- Discuss in your groups
- Your own questions and thoughts..
- Report to the audience

START

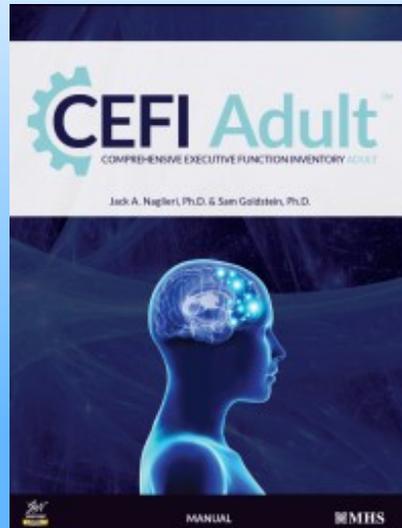
4

minutes  
left



conclusions

## CEFI – ADULT FORM (2017)



conclusions

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## CEFI Adult (ages 18+)

**Observer Form**

|                        |                                          |
|------------------------|------------------------------------------|
| CLIENT'S NAME/ID       | TODAY'S DATE: Year / Month / Day         |
| GENDER                 | BIRTH DATE: Year / Month / Day           |
| CM / CFI               |                                          |
| OBSERVER'S NAME/ID     | AGE: Years / Months / Days               |
| RELATIONSHIP TO CLIENT | TIME KNOWN CLIENT: Years / Months / Days |
| EXAMINER:              |                                          |

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- Same scale structure as CEFI
- Full Scale
  - Attention
  - Emotion Regulation
  - Flexibility
  - Inhibitory Control
  - Initiation
  - Organization
  - Planning
  - Self-Monitoring
  - Working Memory

conclusions

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# CEFI Adult (ages 18+)

➤ 80 items in same 9 scales

**Observer Form**

CLIENT'S NAME: \_\_\_\_\_ TODAY'S DATE: Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

**INSTRUCTIONS:** Read each statement that follows the phrase: "During the past four weeks, how often did the individual...", then circle the letter under the word that tells how often it happened. Read each question carefully, then mark how often you saw it happened in the past four weeks. Answer every question without skipping any. If you want to change your answer, put an X through it and circle your new choice. Be sure to answer every question.

During the past four weeks, how often did the individual...

|                                      | Never | Rarely | Sometime | Often | Very Often | Always |
|--------------------------------------|-------|--------|----------|-------|------------|--------|
| 1. show self-control?                | N     | R      | S        | O     | V          | A      |
| 2. have trouble finding things?      | N     | R      | S        | O     | V          | A      |
| 3. maintain self-control?            | N     | R      | S        | O     | V          | A      |
| 4. plan ahead?                       | N     | R      | S        | O     | V          | A      |
| 5. remember many things at one time? | N     | R      | S        | O     | V          | A      |
| 6. know when a task was completed?   | N     | R      | S        | O     | V          | A      |

conclusions

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# CEFI Adult (ages 18+)

➤ Same interpretation method

**CEFI ADULT RESULTS**

See chapter 3 of the CEFI Adult Technical Manual for complete scoring instructions.

- See the circled raw scores in the appropriate Norms Conversion Table to find the **Standard Score**, **Percentile Rank**, and **Classification** for each scale.
- Individual's Average:** Sum the CEFI Adult Scales' standard scores and divide the total by nine. Round to one decimal place.
- Difference from Individual's Average:** Subtract the Individual's Average from the standard score for each CEFI Adult Scale. Retain the positive and negative signs.
- Determine if **Differences from Average** are **Statistically Significant** (see Table 3.4 in chapter 3).
- Determine if each CEFI Adult Scale is an **Executive Function Strength** (standard score is greater than 109 and significantly higher than Individual's Average), or an **Executive Function Weakness** (standard score is less than 90 and significantly lower than the Individual's Average).
- 90%/95% Confidence Intervals:** Locate values in appendix B of the CEFI Adult Technical Manual.

| Full Scale | Standard Score | 90%/95% (circle one) Confidence Interval |  | Percentile Rank | Classification |  |
|------------|----------------|------------------------------------------|--|-----------------|----------------|--|
|            |                | _____ to _____                           |  |                 |                |  |

| CEFI Adult Scales             | Standard Score | Difference from Average | Statistically Significant? (Yes/No) | Executive Function Strength/Weakness | 90%/95% (circle one) Confidence Interval | Percentile Rank | Classification |
|-------------------------------|----------------|-------------------------|-------------------------------------|--------------------------------------|------------------------------------------|-----------------|----------------|
| Attention (AT)                |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Emotion Regulation (ER)       |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Flexibility (FX)              |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Inhibitory Control (IC)       |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Initiation (IT)               |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Organization (OG)             |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Planning (PL)                 |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Self-Monitoring (SM)          |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| Working Memory (WM)           |                |                         |                                     |                                      | _____ to _____                           |                 |                |
| <b>Sum of Standard Scores</b> | → + 9          | ← Individual's Average  |                                     |                                      |                                          |                 |                |

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# Interpretive Report




Jack A. Nagler, Ph.D. & Sam Goldstein, Ph.D.

### Self-Report Form Interpretive Report

**Name/ID:** John Sample  
**Age:** 35 years  
**Gender:** Male  
**Birth Date:** February 16, 1982  
**Administration Date:** September 5, 2016  
**Examiner:** SC  
**Date Entered By:** SAM

This interpretive report is intended for use by qualified individuals. Parts of this report contain copyrighted material, including test items. It is necessary to provide a copy of this report to anyone other than the examinee, sections containing copyrighted material must be removed.

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CEFI:Adult™ CEFI:Adult™ Self-Report Interpretive Report for John Sample Admin Date: 09/05/2016

### About the Comprehensive Executive Function Inventory: Adult™

The Comprehensive Executive Function Inventory: Adult™ (CEFI:Adult™) Self-Report Form is used to quantify an individual's executive function behaviors in combination with other information, results from the CEFI:Adult™ include an individual's level of executive function in the following areas: Attention, Emotion Regulation, Flexibility, Inhibitory Control, Initiation, Organization, Planning, Self-Monitoring, and Working Memory. This management report provides quantitative information about ratings of the adult. Additional interpretive information can be found in the CEFI:Adult™ Technical Manual.

### About the Ratings

This section of the report provides an evaluation of the ratings provided by the user. Item scores were examined for consistency, negative responses, and number of omitted items. The amount of time took to complete the assessment is also examined. Response time is indicated; the response should be increased with the user to explore possible causes why.

**CONSISTENCY INDEX**

**1**

An inconsistent response style is not indicated.

**NEGATIVE IMPRESSION**

**0**

A negative response style is not indicated.

**OMITTED ITEMS**

**0**

The user did not omit any of the items.

**COMPLETION TIME**

**91 mins**

An unusually slow response time is indicated.

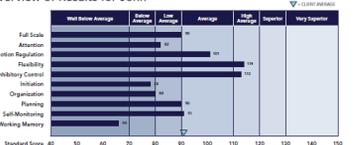
Note: 1 indicates flagged items. Please see CEFI:Adult™ Technical Manual for explanation of flagged items.

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# Interpretive Report

CEFI:Adult™ CEFI:Adult™ Self-Report Interpretive Report for John Sample Admin Date: 09/05/2016

### Overview of Results for John



**Scores in Relation to the Norm and the Individual**

John's results are detailed in the tables below. These scores show how John compares to the normative sample. They also provide an analysis of the variability of John's scores on the respective CEFI:Adult™ Scales. Differences between John's average score and the standard scores on each scale are presented, as is a summary column that indicates whether or not these differences were statistically significant. If a standard score on any of the CEFI:Adult™ Scales is greater than or equal to 1.96 and significantly higher than the client's average score on the CEFI:Adult™ Scales, or less than 1.96 and significantly lower than the client's average score, then that score represents an Executive Function Strength or an Executive Function Weakness, respectively.

| Self Scale  | Standard Score | 90% Confidence Interval | Percentile Rank | Classification |
|-------------|----------------|-------------------------|-----------------|----------------|
| CEFI:Adult™ | 90             | 87-93                   | 25              | Average        |

| CEFI:Adult™ Scale  | Standard Score | 90% Confidence Interval | Percentile Rank | Classification     | Off-Norm Score Average (ST) | Statistically Significant? | Executive Function Strength/Weakness |
|--------------------|----------------|-------------------------|-----------------|--------------------|-----------------------------|----------------------------|--------------------------------------|
| Attention          | 87             | 85-90                   | 13              | Low Average        | 9                           | No                         | ---                                  |
| Emotion Regulation | 101            | 96-106                  | 53              | Average            | +10                         | No                         | ---                                  |
| Flexibility        | 114            | 105-120                 | 82              | High Average       | +23                         | Yes                        | Strength                             |
| Inhibitory Control | 113            | 104-119                 | 81              | High Average       | +22                         | Yes                        | Strength                             |
| Initiation         | 78             | 69-84                   | 4               | Below Average      | -17                         | Yes                        | Weakness                             |
| Organization       | 80             | 75-85                   | 9               | Low Average        | -11                         | No                         | Weakness                             |
| Planning           | 92             | 84-98                   | 26              | Average            | -1                          | No                         | ---                                  |
| Self-Monitoring    | 91             | 84-100                  | 27              | Average            | 0                           | No                         | ---                                  |
| Working Memory     | 66             | 62-77                   | 1               | Well Below Average | -25                         | Yes                        | Weakness                             |

Note: This scale is scored with incomplete data due to omitted items, and was processed to provide the best estimate of executive function. Note: Not Available, could not be calculated due to too many omitted items. See the CEFI:Adult™ Technical Manual for details.

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CEFI:Adult™ CEFI:Adult™ Self-Report Interpretive Report for John Sample Admin Date: 09/05/2016

### Summary of Results

This section of the report provides a summary of scores for the CEFI:Adult™ Scales. Some items may be listed as above or below average. Please see the CEFI:Adult™ Technical Manual for the "Items by Scale" section of this report for more information.

#### FULL SCALE

John's Executive Function score reflects his overall level of executive function skills made up of items that belong to separate scales called Attention, Emotion Regulation, Flexibility, Inhibitory Control, Initiation, Organization, Planning, Self-Monitoring, and Working Memory. Ratings on this scale yielded a standard score of 90 (90% CI = 87-93), which is ranked at the 25th percentile, and falls within the Average range. There was significant variation among the CEFI:Adult™ Scales. Specific areas of strength and weakness were found. Please review the individual scores below for a detailed view of the executive function behaviors.

**Executive Functioning Strengths:**

- Flexibility
- Inhibitory Control

**Executive Functioning Weaknesses:**

- Attention
- Initiation
- Organization
- Working Memory

#### ATTENTION

John's Attention scale score reflects his ability to avoid distractions, concentrate on tasks, and sustain attention. Ratings on this scale yielded a standard score of 87 (90% CI = 76-95), which is ranked at the 13th percentile, and falls within the Low Average range. This scale was found to be an Executive Function Weakness.

Items that were rated **above average**: No items were rated as above average on this scale.  
 Items that were rated **below average**: 9 (1-30-66)

#### EMOTION REGULATION

John's Emotion Regulation scale score reflects his ability to control and manage his emotions, including staying calm when handling small problems and meeting with the right level of emotion. Ratings on this scale yielded a standard score of 101 (90% CI = 94-108), which is ranked at the 53rd percentile, and falls within the Average range.

Items that were rated **above average**: No items were rated as above average on this scale.  
 Items that were rated **below average**: No items were rated as below average on this scale.

#### FLEXIBILITY

John's Flexibility scale score reflects his ability to adjust his behavior to meet circumstances, including coming up with different ways to solve problems, changing his behavior when needed, and being able to come up with new ways to reach a goal. Ratings on this scale yielded a standard score of 114 (90% CI = 105-120), which is ranked at the 82nd percentile, and falls within the High Average range. This scale was found to be an Executive Function Strength.

Items that were rated **above average**: 7 (1-66-88)  
 Items that were rated **below average**: No items were rated as below average on this scale.

#### INHIBITORY CONTROL

John's Inhibitory Control scale score reflects his ability to control his behavior or impulses, including thinking about consequences before acting, recognizing social cues, and being able to wait. Ratings on this scale yielded a standard score of 113 (90% CI = 104-119), which is ranked at the 81st percentile, and falls within the High Average range. This scale was found to be an Executive Function Strength.

Items that were rated **above average**: 1 (3-13)  
 Items that were rated **below average**: No items were rated as below average on this scale.

Note: CI = Confidence Interval

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# Interpretive Report

**CEFI Adult** CEFI Adult Self-Report Interpretive Report for John Sample  
Admin Date: 06/05/2016

**Items by Scale (Continued)**

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**CEFI Adult Scales**  
Note: For the CEFI Adult Scales, item scores that are substantially above the average are indicated by a lightly shaded cell (e.g., 10), and those substantially below the average are in a darker cell (e.g., 1).

| Item                                            | Score | Item                                               | Score |
|-------------------------------------------------|-------|----------------------------------------------------|-------|
| 18. pay attention for a long time?              | 1     | 1. show self control?                              | 10    |
| 19. pay attention during a boring task?         | 1     | 2. maintain self control?                          | 10    |
| 22. have trouble listening to instructions? (R) | 1     | 13. think of the consequences before acting?       | 4     |
| 31. work well in a noisy environment?           | 10    | 29. suggest thoughts/ideas?                        | 1     |
| 35. pay attention to details?                   | 1     | 44. have trouble waiting your turn? (R)            | 1     |
| 45. concentrate while working?                  | 1     | 54. have trouble waiting to get what you want? (R) | 1     |
| 46. get distracted? (R)                         | 1     | 45. think before acting?                           | 4     |
| 48. take notes when reading?                    | 10    | 73. think before speaking?                         | 10    |

| Item                                           | Score | Item                                                      | Score |
|------------------------------------------------|-------|-----------------------------------------------------------|-------|
| 17. stay calm when handling a small problem?   | 1     | 16. start tasks easily?                                   | 1     |
| 27. find it hard to control your emotions? (R) | 1     | 26. need others to tell you to get started on things? (R) | 1     |
| 34. react with the right level of emotion?     | 1     | 39. fail to get things done easily? (R)                   | 1     |
| 40. manage frustration?                        | 1     | 41. start something without being asked?                  | 1     |
| 50. become upset in new situations? (R)        | 1     | 42. need others to tell you to do things? (R)             | 1     |
| 58. respond calmly to things?                  | 1     | 52. appear motivated?                                     | 1     |
| 76. get upset when plans have changed? (R)     | 1     | 71. seem too anxious? (R)                                 | 1     |
| 78. control emotions when under stress?        | 1     | 80. take mistakes?                                        | 1     |

| Item                                               | Score | Item                                | Score |
|----------------------------------------------------|-------|-------------------------------------|-------|
| 7. come up with different ways to solve a problem? | 1     | 2. have trouble finding things? (R) | 1     |
| 16. explore different ways of doing things?        | 1     | 52. get things done efficiently?    | 1     |
| 41. change your behavior as needed?                | 1     | 21. work neatly?                    | 1     |
| 51. compromise when needed?                        | 1     | 28. get things done on time?        | 1     |
| 59. consider other people's needs?                 | 1     | 43. change how often you work?      | 1     |
| 64. react to change? (R)                           | 1     | 53. organize your thoughts well?    | 1     |
| 68. come up with a new way to reach a goal?        | 1     | 45. organize tasks well?            | 1     |
| 74. react well to new demands?                     | 1     | 72. appear disorganized?            | 1     |

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**CEFI Adult** CEFI Adult Self-Report Interpretive Report for John Sample  
Admin Date: 06/05/2016

**Items by Scale (Continued)**

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| Item                                                            | Score | Item                                          | Score |
|-----------------------------------------------------------------|-------|-----------------------------------------------|-------|
| 4. plan ahead?                                                  | 1     | 5. remember many things at one time?          | 1     |
| 9. have trouble solving problems? (R)                           | 1     | 15. forget to do things? (R)                  | 1     |
| 14. know what to do first?                                      | 1     | 24. remember instructions with many steps?    | 1     |
| 26. prepare for upcoming events?                                | 4     | 32. hold a set of ideas in memory?            | 1     |
| 33. have trouble judging how long it takes to do something? (R) | 1     | 43. follow instructions well?                 | 1     |
| 39. think through your decisions?                               | 1     | 52. remember important things?                | 1     |
| 49. solve problems creatively?                                  | 1     | 47. keep goals in mind when making decisions? | 1     |
| 77. make good decisions?                                        | 1     | 76. forget where you put things?              | 1     |

| Item                                            | Score |
|-------------------------------------------------|-------|
| 4. know when a task was completed?              | 1     |
| 25. keep track of time?                         | 1     |
| 36. notice his/her mistakes?                    | 1     |
| 44. seem from past mistakes?                    | 1     |
| 55. notice how his/her actions affected others? | 1     |
| 63. ask for help when needed?                   | 1     |
| 66. make careless errors? (R)                   | 1     |
| 75. fix his/her mistakes?                       | 1     |

# CEFI Adult Online vs Paper

➤ No differences across administration method

**Table F.2. Mean Standard Score Differences Between Administration Methods for the CEFI Adult Self-Report Form**

| Scale              | Obt. <i>r</i> | Cor. <i>r</i> | Online   |           | Paper-and-Pencil |           | <i>d</i> -ratio | <i>F</i> (1, 53) | <i>p</i> |
|--------------------|---------------|---------------|----------|-----------|------------------|-----------|-----------------|------------------|----------|
|                    |               |               | <i>M</i> | <i>SD</i> | <i>M</i>         | <i>SD</i> |                 |                  |          |
| Full Scale         | .99           | .99           | 102.9    | 12.4      | 102.7            | 12.6      | -0.01           | 0.40             | .531     |
| Attention          | .90           | .96           | 101.9    | 11.3      | 101.7            | 12.0      | -0.02           | 0.07             | .793     |
| Emotion Regulation | .97           | .98           | 103.8    | 13.7      | 103.8            | 13.8      | 0.00            | 0.01             | .938     |
| Flexibility        | .98           | .99           | 103.1    | 13.3      | 103.3            | 13.5      | 0.01            | 0.29             | .590     |
| Inhibitory Control | .97           | .98           | 101.5    | 13.5      | 101.2            | 13.6      | -0.03           | 0.65             | .423     |
| Initiation         | .89           | .95           | 102.4    | 12.3      | 102.1            | 11.9      | -0.03           | 0.19             | .662     |
| Organization       | .95           | .98           | 102.2    | 11.6      | 102.2            | 11.0      | 0.00            | 0.01             | .942     |
| Planning           | .95           | .98           | 102.7    | 11.6      | 102.3            | 12.1      | -0.04           | 0.68             | .412     |
| Self-Monitoring    | .98           | .99           | 101.9    | 12.2      | 101.9            | 12.2      | 0.00            | 0.03             | .856     |
| Working Memory     | .98           | .99           | 102.6    | 13.1      | 102.3            | 13.4      | -0.03           | 0.65             | .424     |

Note. Obt. *r* = Obtained correlation, Cor. *r* = Corrected correlation. All correlations significant, *p* < .001. *N* = 52. Guidelines for interpreting Cohen's *d* are as follows: small effect size = 0.2, medium effect size = 0.5, and large effect size = 0.8. Positive *d*-ratio values indicate higher scores for the paper-and-pencil administration.

# CEFI Adult Race & Ethnicity

**Table 8.9. CEFI Adult Full Scale Score Comparison Between Black and White Groups**

| Form             |           | Black Sample | Matched White Sample | <i>d</i> -ratio | <i>F</i> (df) | <i>p</i> |
|------------------|-----------|--------------|----------------------|-----------------|---------------|----------|
| Self-Report Form | <i>M</i>  | 100.5        | 98.5                 | 0.13            | 1.56 (1,352)  | .212     |
|                  | <i>SD</i> | 16.2         | 14.4                 |                 |               |          |
|                  | <i>N</i>  | 177          | 177                  |                 |               |          |
| Observer Form    | <i>M</i>  | 99.5         | 99.7                 | -0.01           | 0.02 (1,362)  | .892     |
|                  | <i>SD</i> | 15.5         | 13.9                 |                 |               |          |
|                  | <i>N</i>  | 182          | 182                  |                 |               |          |

**Note.** Guidelines for interpreting Cohen's *d* are as follows: small effect size = 0.2, medium effect size = 0.5, large effect size = 0.8. Positive *d*-ratio values indicate higher scores in the Black sample.

**Table 8.10. CEFI Adult Full Scale Score Comparison Between Hispanic and White Groups**

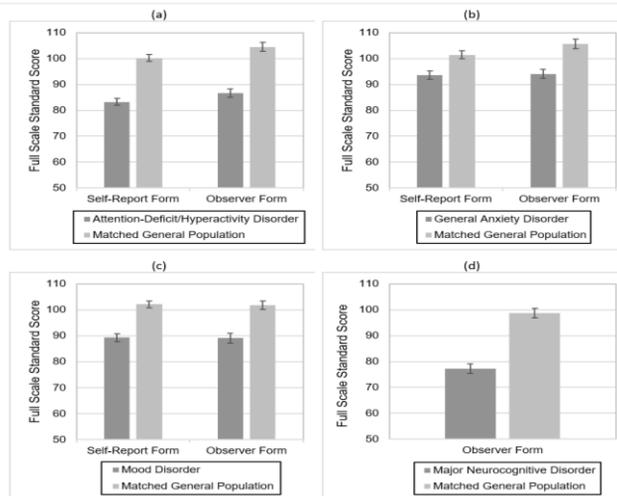
| Form             |           | Hispanic Sample | Matched White Sample | <i>d</i> -ratio | <i>F</i> (df) | <i>p</i> |
|------------------|-----------|-----------------|----------------------|-----------------|---------------|----------|
| Self-Report Form | <i>M</i>  | 101.0           | 99.4                 | 0.10            | 0.95 (1,346)  | .330     |
|                  | <i>SD</i> | 16.8            | 13.6                 |                 |               |          |
|                  | <i>N</i>  | 174             | 174                  |                 |               |          |
| Observer Form    | <i>M</i>  | 98.9            | 100.6                | -0.12           | 1.29 (1,358)  | .258     |
|                  | <i>SD</i> | 14.7            | 15.0                 |                 |               |          |
|                  | <i>N</i>  | 180             | 180                  |                 |               |          |

**Note.** Guidelines for interpreting Cohen's *d* are as follows: small effect size = 0.2, medium effect size = 0.5, large effect size = 0.8. Positive *d*-ratio values indicate higher scores in the Hispanic sample.

**Note:** . Samples of Black and Hispanic individuals from the normative sample were compared to samples of White individuals from the normative sample matched on age, gender, U.S. geographical region, and education level.

# CEFI Adult Group Differences

**Figure 8.1. CEFI Adult Full Scale Differences Between ADHD, GAD, Mood Disorder, and Major Neurocognitive Disorder Samples and Matched General Population Samples**



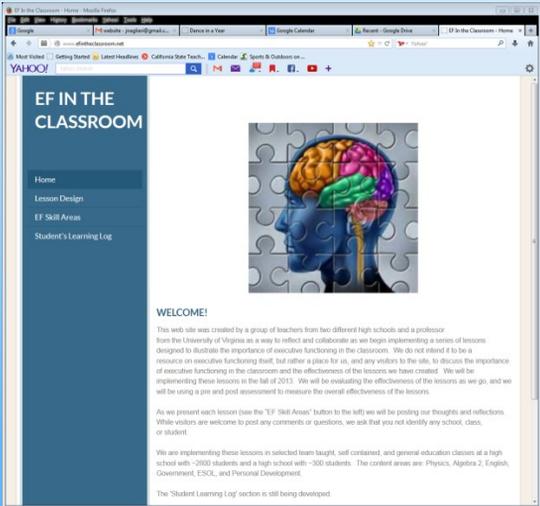
**Note.** Gen. Pop. = Matched sample from the general population portion of the respective normative sample; Error bars represent standard error.

# INTERVENTIONS FOR EF BEHAVIORS

conclusions 101

## www.efintheclassroom.net

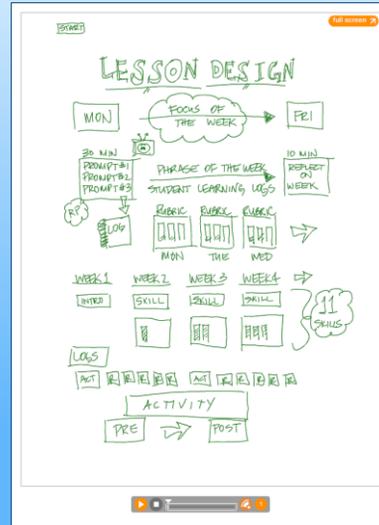
➤ Start with Awareness of thinking about thinking



conclusions 102

## Structure of the lessons

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



conclusions

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## Interventions for EF Behaviors

### ➤ CEFI Scales

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

### ➤ Efintheclassroom.net

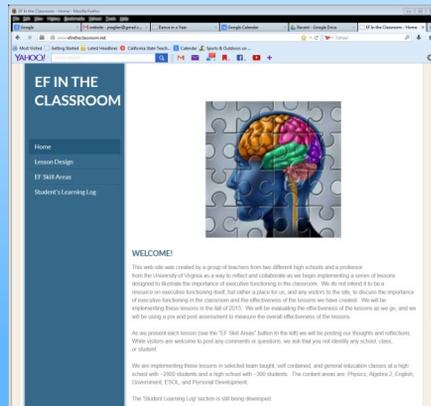
- Sustained Attention
- Emotional Control
- Cognitive Flexibility
- Response Inhibition
- Task Initiation
- Organization
- Planning
- Response Inhibition
- Working Memory
- Goal Directed Persistence

conclusions

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## Other Lessons from www.efintheclassroom.net

### Working Memory Lesson



conclusions

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## Interventions for EF Behaviors

- | ➤ CEFI Scales        | ➤ Efintheclassroom.net      |
|----------------------|-----------------------------|
| ▪ Attention          | ▪ Sustained Attention       |
| ▪ Emotion Regulation | ▪ Emotional Control         |
| ▪ Flexibility        | ▪ Cognitive Flexibility     |
| ▪ Inhibitory Control | ▪ Response Inhibition       |
| ▪ Initiation         | ▪ Task Initiation           |
| ▪ Organization       | ▪ Organization              |
| ▪ Planning           | ▪ Planning                  |
| ▪ Self-Monitoring    | ▪ Response Inhibition       |
| ▪ Working Memory     | ▪ Working Memory            |
|                      | ▪ Goal Directed Persistence |

conclusions

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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)

conclusions

## 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.

conclusions

**Ready  
Trial 1**

**START**

conclusions

This slide features a blue gradient background. On the left side, there is a vertical white line with a small green circle above it and several overlapping white circles below. In the center, a pink rectangular box contains the text 'Ready Trial 1' in bold black font. To the right of this box is a large green arrow pointing right, with the word 'START' in bold black text inside it. The word 'conclusions' is written in a small, light blue font in the bottom right corner.

conclusions

This slide has the same blue gradient background and left-side decorative elements as the first slide. A large, semi-transparent blue rectangular area covers most of the central and right portions of the slide, obscuring any text that might have been there. The word 'conclusions' is written in a small, light blue font in the bottom right corner.



**Put the words in groups.  
Write them down.**

conclusions

**Next Item:  
Put the words in **SOME**  
**NUMBER** of groups.**

conclusions

**Ready  
Trial 2**

**START**

conclusions

This slide features a blue gradient background. On the left side, there is a vertical white line with a small green circle above it and a series of overlapping white circles below. In the center, a yellow rectangular box contains the text 'Ready Trial 2' in bold black font. To the right of this box is a large green arrow pointing right, with the word 'START' in bold black text inside it. The word 'conclusions' is written in a small, light blue font in the bottom right corner.

conclusions

This slide has the same blue gradient background and left-side decorative elements as the first slide. A large, solid green rectangular area covers the majority of the slide's content space. The word 'conclusions' is written in a small, light blue font in the bottom right corner.



**Put the words into groups.  
Write them down.**

conclusions

## **Let's Take a Mindful Moment or Brain Break (or Syn-nap)**

The brain needs time  
**process!**

- **Stretch**
- Cross Laterals
- Walk and Talk
- Energizers
- Relaxers

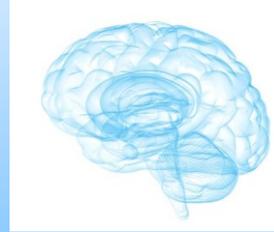


conclusions

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## 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
- Impairment and EF
- 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

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## 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

conclusions

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## Cognition or Knowledge?

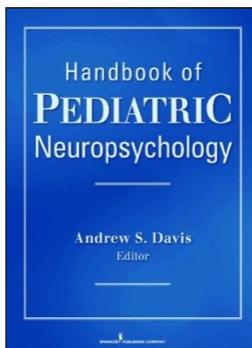
- What does the student have to **know** to complete a task?
  - This is dependent on *instruction*
- How does the student have to **think** to complete a task?
  - This is dependent on the *brain – PASS*



## A Theory of Learning

### 28 Cognitive Assessment System: Redefining Intelligence From a Neuropsychological Perspective

Jack A. Naglieri and Tulio M. Otero



an important field of clinical, developmental, psychiatric, and educational psychology. By addressing the various factors intrinsic to the development of reasoning, planning, and problem-solving abilities, clinicians can better understand children with a variety of developmental disorders. This book is edited by a leading expert in the field, and is a must-read for all those interested in the social and motor aspects of an individual's development. It is also used by neuropsychologists and other professionals who use derivative inferences from neuroimaging technology, such as functional MRI (fMRI), positron emission tomography, computerized tomography, and diffusion tensor imaging, has reduced the need for neuropsychological tests to localize and access brain damage. Neuropsychological tests, however,

Such tools also provide information and add

FROM NEUROPSYCHOLOGY TO ASSESSMENT

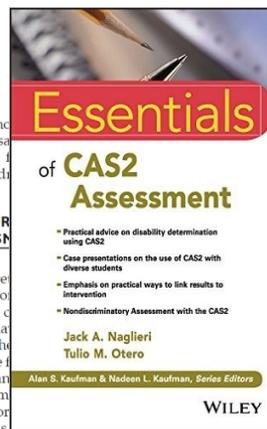
Luria's theory of brain-behavior orders that the brain, the

and clinical in

terated in works

1980) and *The Working Brain* (1973). Luria viewed the brain

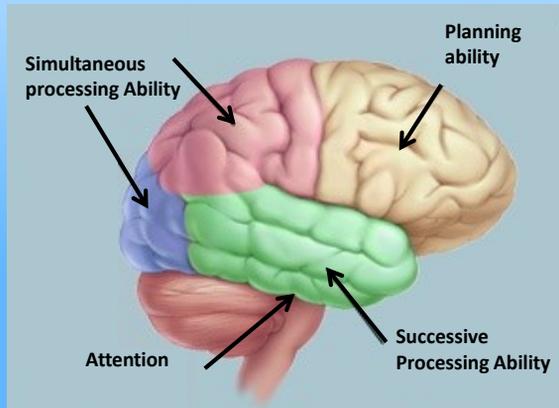
as a functional mosaic, the parts of which interact in dif-



## 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.

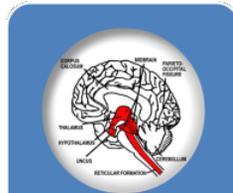


## IQ defined by BRAIN function

- **PASS** 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

## The Brain and Intelligence as PASS

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



### Attention

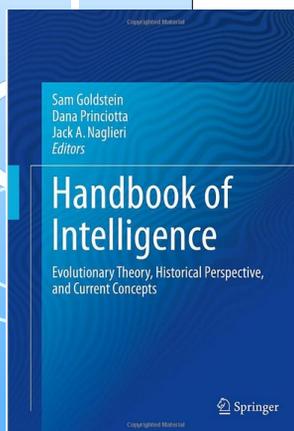
Focused cognitive activity and resistance to distraction

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conclusions

## 100 Years of Intelligence and IQ

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



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

20

Jack A. Naglieri

*"Do not go where the path may lead, go instead where there is no path and leave a trail."*

—Ralph Waldo Emerson

1917, is remembered as the day the American Psychological Association entered World War I. On that same day, a group of psychologists held a meeting in the University of Chicago's Emerson Hall to discuss the ways in which they could play with the war effort (Luria, 1972). The group agreed that psychological knowledge and methods could be of importance to the military and utilized to increase the efficiency of the Army and Navy personnel. The group included Robert Yerkes, who was also the president of the American Psychological Association, and Lewis Terman, who was the director of the Training School in Vineland, New Jersey, on May 28. The committee considered many types of group tests and several that Arthur S. Otis developed when working on his doctorate under Lewis Terman at Stanford University. The goal was to find tests that could efficiently evaluate a wide variety of men, be easy to administer in the group format, and be easy to score. By June 9, 1917, the materials were ready for an initial trial. Men who had some educational background and could speak English were administered the verbal and quantitative (Alpha) tests and those that could not read the newspaper or speak English were given the Beta tests (today described as nonverbal).

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## CAS2

- CAS2 Yields PASS and Full Scale score but ALSO
- Executive Function is the combination of Planning and Attention subtests
- Also: Working Memory, Verbal, Nonverbal and a Visual and Auditory comparison

**CAS2 Cognitive Assessment System Second Edition**

**Examiner Record Form**  
Jack A. Naglieri J. P. Das Sam Goldstein

**Section 1. Identifying Information**  
Student's Name: William  
Sex: Female  Male  Grade: 2nd  
School: Unified Elementary  
Examiner: Janice Wilson, Ph.D.

| Date Tested | Year | Month | Day |
|-------------|------|-------|-----|
| 2019        | 2019 | 10    | 22  |

| Date of Birth | Year | Month | Day |
|---------------|------|-------|-----|
| 2006          | 2006 | 10    | 22  |

| Age | Year | Month | Day |
|-----|------|-------|-----|
| 7   | 7    | 10    | 22  |

**Section 2. Subtest and Composite Scores**

| Subtest                            | Raw Score | Scaled Score |     |     |     |    |
|------------------------------------|-----------|--------------|-----|-----|-----|----|
|                                    |           | PLAN         | SM  | ATT | SSC |    |
| Planned Color (PCL)                | 34        | 7            |     |     |     |    |
| Planned Connections (PCN)          | 12        | 5            |     |     |     |    |
| Planned Number Matching (PNN)      | 10        | 5            |     |     |     |    |
| Number (NM)                        | 20        |              | 10  |     |     |    |
| Visual Spatial Relations (VSR)     | 18        |              | 11  |     |     |    |
| Figure Memory (FM)                 | 16        |              | 10  |     |     |    |
| Expressive Attention (EA)          | 18        |              |     | 9   |     |    |
| Number Detection (ND)              | 14        |              |     | 10  |     |    |
| Receptive Attention (RA)           | 19        |              |     | 9   |     |    |
| Word Series (WS)                   | 11        |              |     |     | 7   |    |
| Optimism-Regretful Questions (ORQ) | 8         |              |     |     | 7   |    |
| Visual Digit Span (VDS)            | 10        |              |     |     | 6   |    |
|                                    |           | PLAN         | SM  | ATT | SSC | FL |
| Sum of Scaled Scaled Scores        | 239       | 31           | 28  | 20  | 102 |    |
| Index Composite Index Scores       | 84        | 82           | 76  | 87  |     |    |
| Percentile Rank                    | 14        | 95           | 99  | 8   | 91  |    |
| % Confidence Interval              | 92        | 106          | 104 | 87  | 92  |    |
| Lower                              | 71        | 76           | 87  | 74  | 89  |    |

**Section 3. Subtest and Composite Profiles**

Index Score Profile: PLAN SM ATT SSC FL

Scaled Score Profile: PLAN SM ATT SSC

**Section 4. Descriptive Terms**

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

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

## PASS Theory: Planning

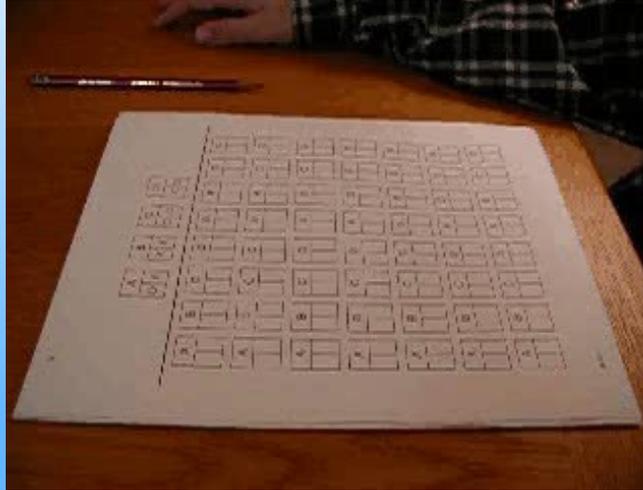
- ▶ Planning is a neurocognitive ability that a person uses to determine, select, and use efficient solutions to problems
  - problem solving
  - developing plans and using strategies
  - retrieval of knowledge
  - impulse control and self-control
  - control of processing



conclusions

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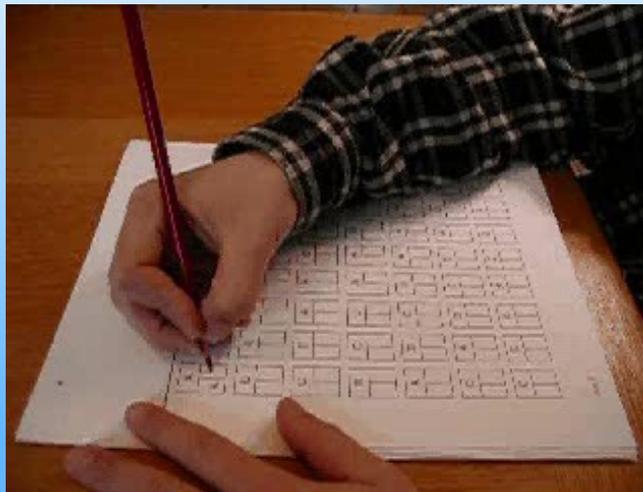
## Planned Codes 1



conclusions

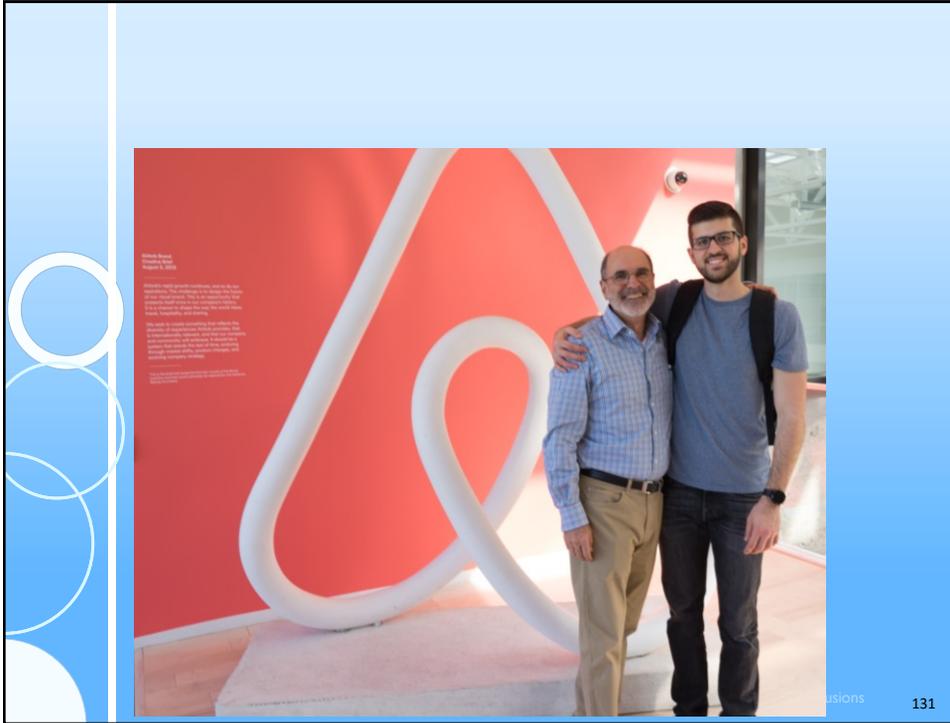
129

## Planned Codes Page 2



conclusions

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usions

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## 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.

Name \_\_\_\_\_

### Doubles and Near Doubles

double  $8 + 8 = 16$

How many are there? near double  $8 + 9 = 17$

Ring the double. Add.

1.  $6 + 6 = 12$   
 $6 + 7 = 13$

2.  $5 + 5 = 10$   
 $5 + 6 = 11$

3.  $7 + 7 = 14$   
 $7 + 8 = 15$

4.  $4 + 4 = 8$   
 $4 + 5 = 9$

**CHECK** If you know the sum of  $8 + 8$ , how can you find  $8 + 9$ ?

three hundred thirty-five 335

# 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

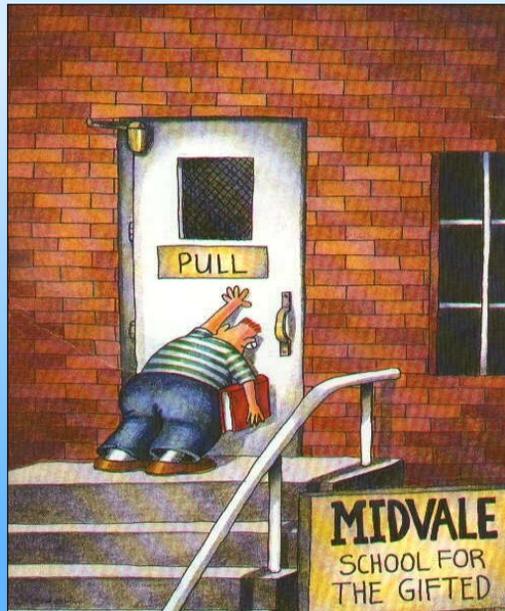
Examples of classroom problems related to Plan

- using the same strategy even if it is not effective
- Struggling with how to complete tasks
- Not monitoring progress during a task
- Misinterpretation of what is read

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



## POOR PLANNING



conclusions

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# 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.

conclusions

135

## Antwerp train Station (2009)



conclusions

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## 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)

conclusions

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## 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)

conclusions

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## 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?

Like the Seinfeld video

conclusions

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## This Planning Lesson

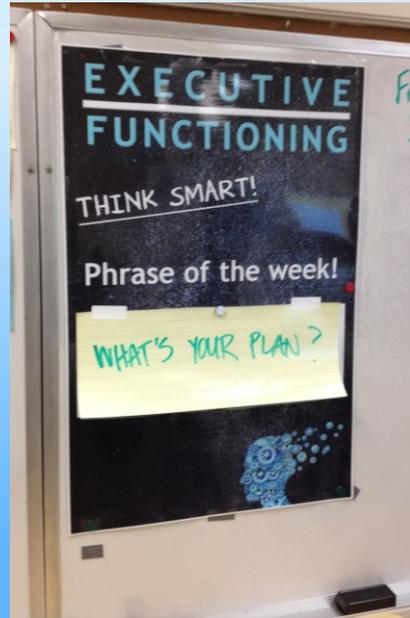
- This lesson brings to light the important distinction between planning over a long time (what was just shown) and real time planning

conclusions

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## EF Instruction

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

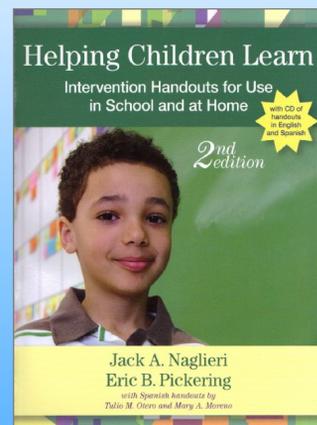


conclusions

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## 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.



conclusions

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## Step 1 – Talk with Students

### How to Be Smart: Planning

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

#### What Does Being Smart Mean?

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

## 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.

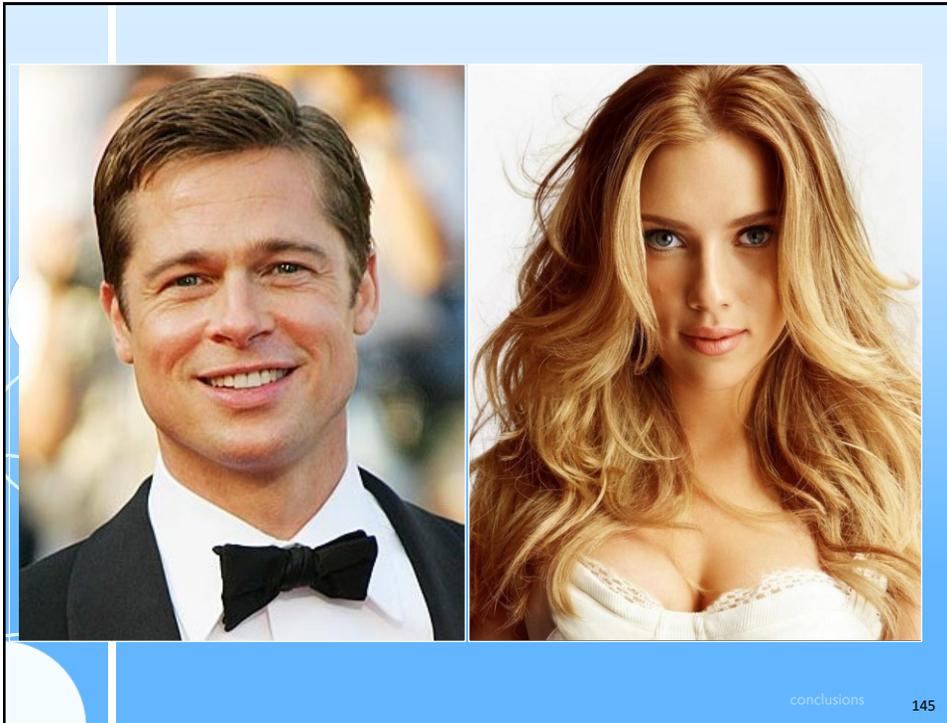
You will be able to do more if you remember to use a plan. An easy way to remember to use a plan is to look at the picture "Think smart and use a plan!" (Figure 1). You should always use a plan for reading, vocabulary, spelling, writing, math problem solving, and science.

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.

**Think smart  
and use a plan!**



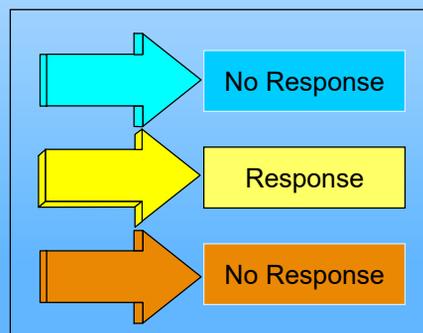
It is smart to have a plan for doing all schoolwork. When you read, you should have a plan. One plan is to look at the questions you have to answer about the story first. Then read the story to find the answers. Another plan is to make a picture of what you read so that you can see all the parts of the 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

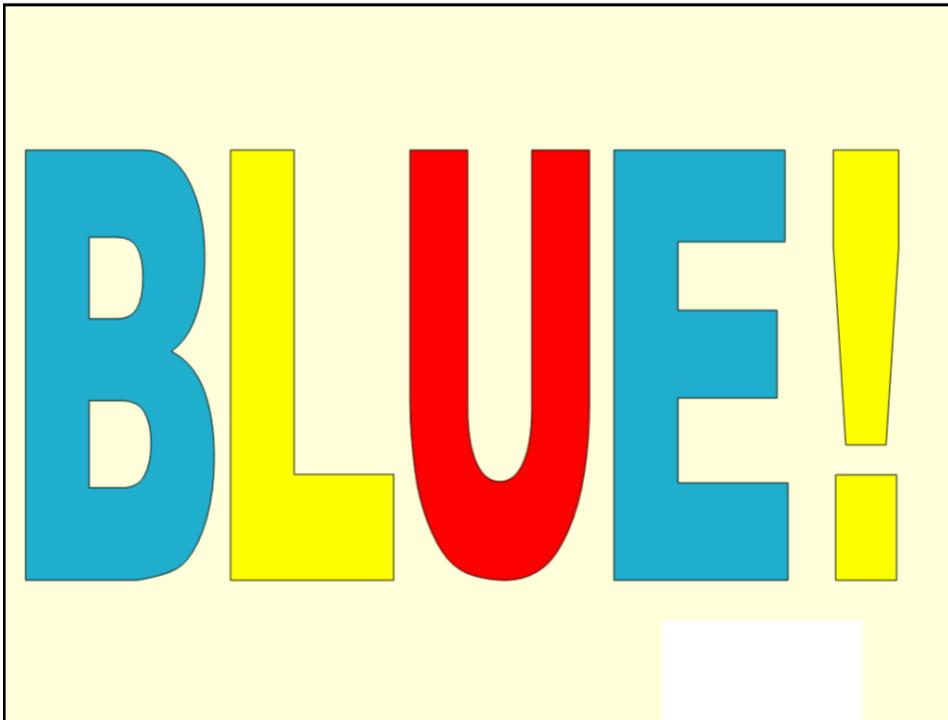
**RED**

Your task: say the COLOR (green) not the word (red)

|        |        |        |        |
|--------|--------|--------|--------|
| RED    | BLUE   | GREEN  | YELLOW |
| YELLOW | GREEN  | RED    | BLUE   |
| RED    | YELLOW | YELLOW | GREEN  |
| BLUE   | GREEN  | RED    | BLUE   |
| GREEN  | YELLOW | RED    | YELLOW |

READY ?

conclusions 147



## Expressive Attention - Italiano

|        |        |        |        |
|--------|--------|--------|--------|
| ROSSO  | BLU    | VERDE  | GIALLO |
| GIALLO | VERDE  | ROSSO  | BLU    |
| ROSSO  | GIALLO | GIALLO | VERDE  |
| BLU    | VERDE  | ROSSO  | ROSSO  |
| VERDE  | GIALLO | BLU    | GIALLO |

conclusions

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## Expressive Attention – Korean CAS

□ The child says the color not the word

|    |    |    |    |
|----|----|----|----|
| 노랑 | 초록 | 빨강 | 파랑 |
| 빨강 | 노랑 | 노랑 | 초록 |
| 초록 | 파랑 | 초록 | 빨강 |
| 초록 | 노랑 | 빨강 | 노랑 |
| 빨강 | 파랑 | 빨강 | 초록 |

conclusions

150

## Attention

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

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



leave school

11. 3:15 p.m.

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

A 6:22 A.M. B 5:22 P.M. C 6:10 P.M. D 6:22 P.M.

12. 6:22 p.m.

13. Maura began basketball practice at 3:00 P.M. and finished 50 minutes later. What time did she finish?

A 3:50 P.M. B 3:05 A.M. C 4:05 P.M. D 4:50 A.M.

13. 3:50 p.m.

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

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

14. 3 hours 45 min.

conclusions

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## PASS Theory: Attention

### Attention

- Focus on one thing and ignore others

Examples of classroom problems related to

- Trouble focusing on what is important
- Difficulty resisting distractions
- Difficulty working on the same task for very long
- Unable to see all the details
- Providing incomplete or partially wrong answers

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



## Efintheclassroom.net

### 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.

conclusions

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## Efintheclassroom.net

### Attention Lesson

#### 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 your 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.

conclusions

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## Attention Lesson



OK

conclusions

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## Time to Think and Talk

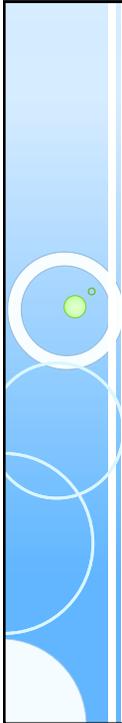
- **Task:**
- Why do you think you were tricked by this video?
  - How do you decide what to pay attention to, and what not to, in this class?
  - What are you biggest distractions in class?
  - What will you have the hardest time ignoring?
  - Your own questions and thoughts..

START

**4**  
minutes  
left



conclusions



## WHAT IS NOT EF IN PASS

conclusions 157



## 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

conclusions 158

## 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

conclusions

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## Progressive Matrices

3

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

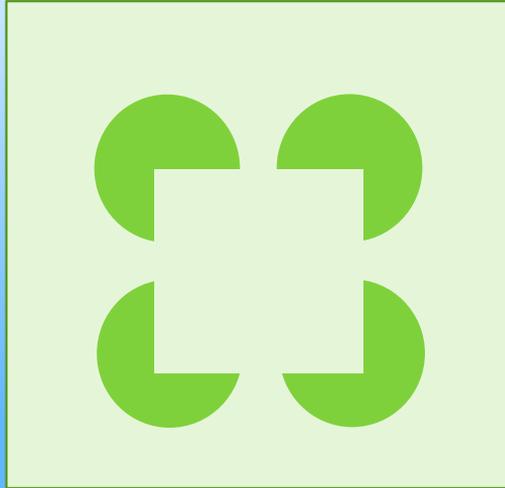
1      2      3      4      5

conclusions

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## PASS Theory

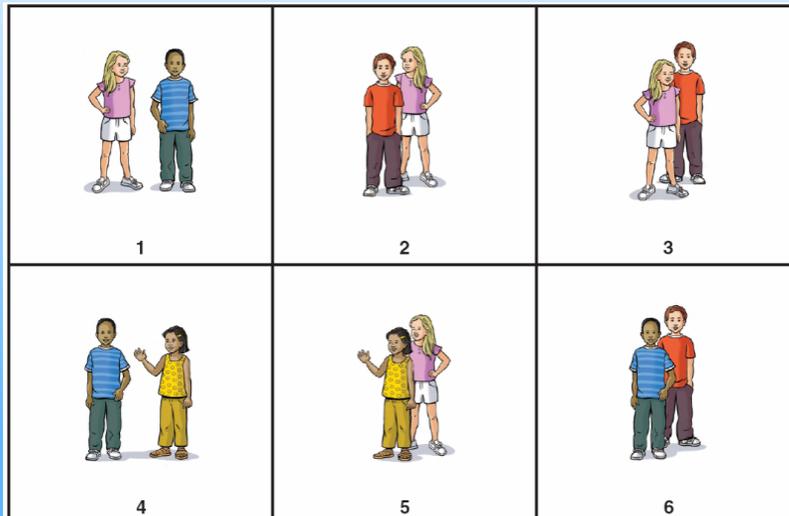
- **Simultaneous** processing is what Gestalt psychology was based on
- Seeing the whole



conclusions

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## 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

Name Jack Secret number \_\_\_\_\_

Write the numbers 1 to 100 in order.

100% beautiful numbers!!

|    |    |    |    |    |    |    |    |    |     |
|----|----|----|----|----|----|----|----|----|-----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20  |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60  |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70  |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80  |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90  |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

TR22 Blank Hundred Chart © J.C. Heun and Company

## PASS Theory: Simultaneous

### Simultaneous Processing

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

Examples of classroom problems related to

- 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?

conclusions

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## Use EF

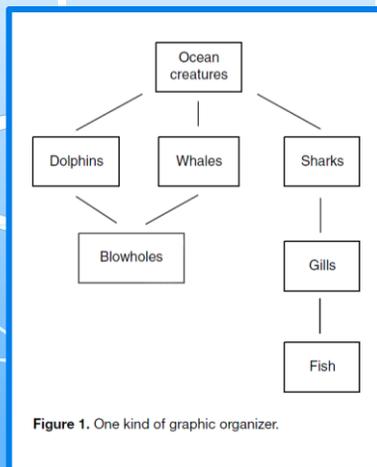


Figure 1. One kind of graphic organizer.

### Graphic Organizers for Connecting and Remembering Information

Remembering and relating information is a common part of learning and daily life. Students are often expected to learn large amounts of new and unfamiliar information. Learning facts requires the student to see how information is connected or related. Students often remember this information better if they see it graphically and understand how it relates to knowledge they already have. Graphic organizers are designed to help students (and teachers) present and organize information so it is easier to understand and remember.

#### Graphic Organizers

New information is better remembered if it is connected to information the students already know. Graphic organizers are visual representations of information that shows the links of new information to other new and existing information. This makes the new information easier to understand and learn. Furthermore, the visual nature of graphic organizers and the links they make help students understand the connections between information parts. For example, a graphic organizer might be used to teach young children about different animals. A child learning about different kinds of animals might already know what a fish is. This knowledge can be used to graphically organize whales, sharks, and dolphins. They all live underwater, but sharks have gills and are fish. (Whales and dolphins have blowholes and breathe air, so they are not fish.) Figure 1 represents one way to map this graphic organizer.

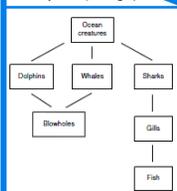


Figure 1. One kind of graphic organizer.

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

#### How to Teach Graphic Organizers

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

1. Select information that you need to present to the child (which may be from a story, a chapter, or any concept).
2. Determine the key components that are necessary for the child to learn.

page 1 of 2

Helping Children Learn Intervention Handouts for Use in School and at Home, Second Edition, by Jack A. Naglen & Eric S. Picketing  
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## Venn Diagram

Graphic Organizers for Connecting and Remembering Information (continued)

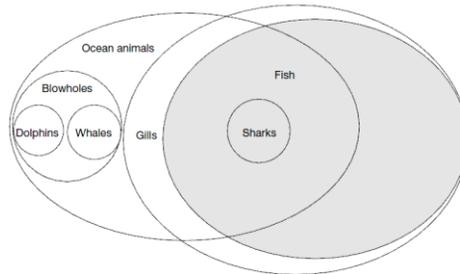


Figure 2. A Venn diagram used as a graphic organizer.

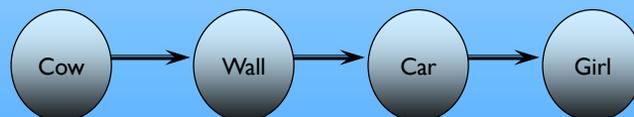
3. Create the graphic representation of the information. The illustration should include the key concepts, concepts the child already knows, and the linkages between the concepts.
4. Present the organizer to the child and discuss it to be sure he or she understands the information and sees the connections.

conclusions

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## 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



conclusions

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## Sentence Questions (Ages 8-17)

- The child answers a question read by the examiner

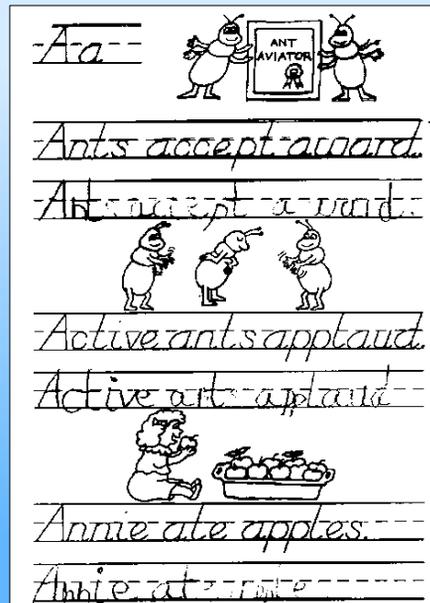
1. The blue is yellow. Who is yellow?
10. The red greened the blue with a yellow. Who used the yellow?
20. The red blues a yellow green of pinks, that are brown in the purple, and then grays the tan. What does the red do first?

conclusions

169

## Successive

The sequence of the sounds is emphasized in this work sheet



conclusions

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## PASS Theory: Successive

### Successive Processing

- Use information in a specific order

#### Examples of classroom problems related to Successive

- 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



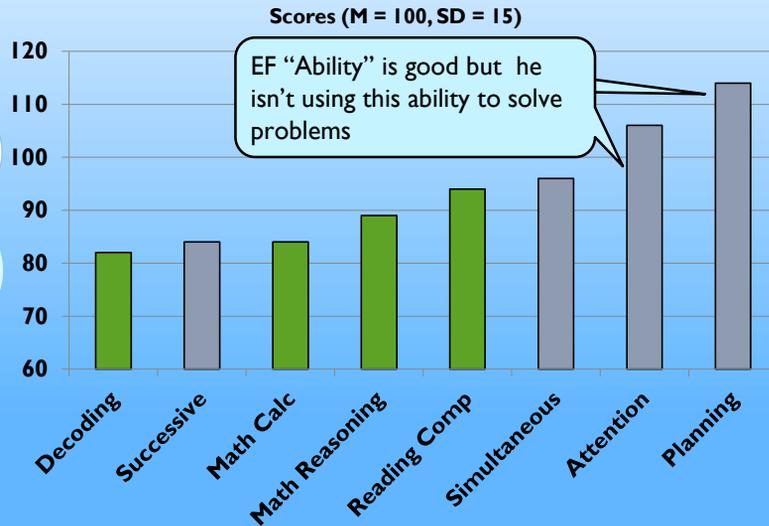
### Ben's Problem with Successive Processing



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



conclusions

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## Case of Ben

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

|                     |            | Diff       |
|---------------------|------------|------------|
| <b>Planning</b>     | <b>114</b> | <b>14</b>  |
| <b>Attention</b>    | <b>106</b> | <b>6</b>   |
| <b>Simultaneous</b> | <b>96</b>  | <b>-4</b>  |
| <b>Successive</b>   | <b>84</b>  | <b>-16</b> |
| <b>PASS Mean</b>    | <b>100</b> |            |

conclusions

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## Ben's Problem with Successive Ability

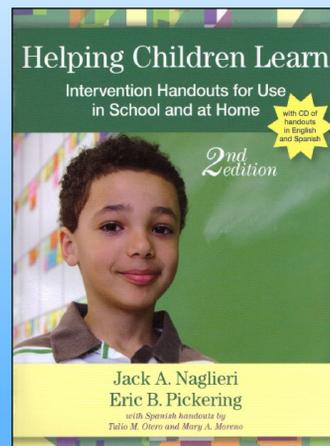
- Ben has difficulty whenever ANY task requires sequencing
  - Academic or ability tests
  - Visual or auditory tests
  - Math or spelling or reading
  - Tasks that require memory of sequences
- How do we help him learn better?

conclusions

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## 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.



conclusions

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## 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.

conclusions

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## Ben's Problem with Successive Ability

➤ Teach him to use strategies

### Chunking for Reading/Decoding

### Segmenting Words for Reading/Decoding and Spelling

Reading  
stand t  
quenc  
more r  
easily c  
units f

**How**

Teache  
be rem

**Plan**

Look at  
Find the  
Sound

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 that represent and how letters work together to make sounds. Sometimes words can be broken into parts for easier and faster reading. The word *into* is a good example because it can be broken into 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 divi

## 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

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## 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
- Impairment and EF
- 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

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## Phineas had Social Emotional deficit

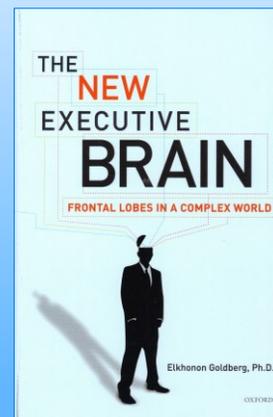
- Phineas had profound social emotional problems after his injury to the frontal lobes
- Phineas is
  - insulting
  - impulsively says things
  - uses vulgar language
  - can't manage his emotions
  - inconsistent in social situations
  - doesn't recognize he is offensive
  - loses control in interactions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

conclusions

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## 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’

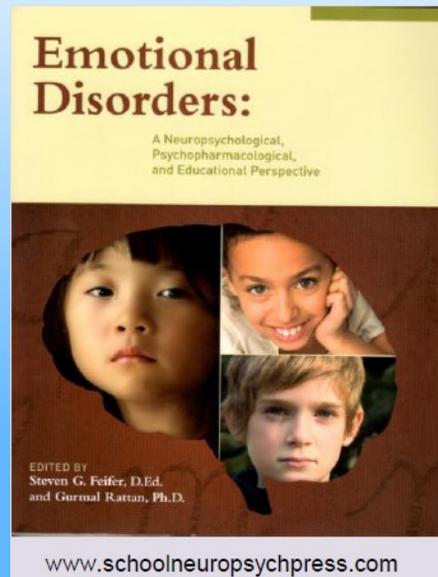


conclusions

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## Feiffer & Rattan (2009)

- Provide a collection of papers on the relationship between EF and Emotional Disorders



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## 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*).

conclusions

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# Social Emotional Skills: From Conceptual to Assessment to Instruction

conclusions 187

## www.casel.org

About Why It Matters In Schools Collaborating Districts Initiative Policy & Advocacy Research

Good science links Social & Emotional Learning to the following:

**STUDENT GAINS**

- Social-emotional skills
- Improved attitudes about self, others, and school
- Positive classroom behavior
- 11 percentile-point gain on standardized achievement tests

**REDUCED RISKS FOR FAILURE**

- Conduct problems
- Aggressive behavior
- Emotional distress

### Benefits of Social and Emotional Learning

Social and emotional learning improves student outcomes.

» READ MORE

#### Collaborating Districts Initiative

Collaborating Districts Initiative

This is a national initiative to take social and emotional learning to scale in eight large districts. Three have already been selected. Five more will be selected by December 2011.

» READ MORE

#### All Invited

Roger Weissberg to speak Oct. 20 in Chicago

Roger Weissberg to speak on Oct. 20 at Investiture of NoVo Endowed Chair of Social and Emotional Learning. Public invited.

» READ MORE

#### Twitter Feed

CASSEL.org: @BarefootBehavior Thanks for the shout-out! We're very excited about this initiative and what it means for the future of #SEL nation-wide!  
*Posted 5 hours, 39 minutes ago*

CASSEL.org: @yannieroux Do you mean the meta-analysis? Summary here <http://it.co/8k2XBEys> with full article download link at bottom.  
*Posted 5 hours, 43 minutes ago*

CASSEL.org: This article discusses benefits students get from afterschool activities & what they mean to overall school engagement <http://it.co/NDw4icgt>

188

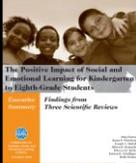
## Skills for Social and Academic Success

### 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.

conclusions

## Social Emotional Skills

Five key social-emotional skills from CASEL

These are in many state and local standards

### What is Social and Emotional Learning?

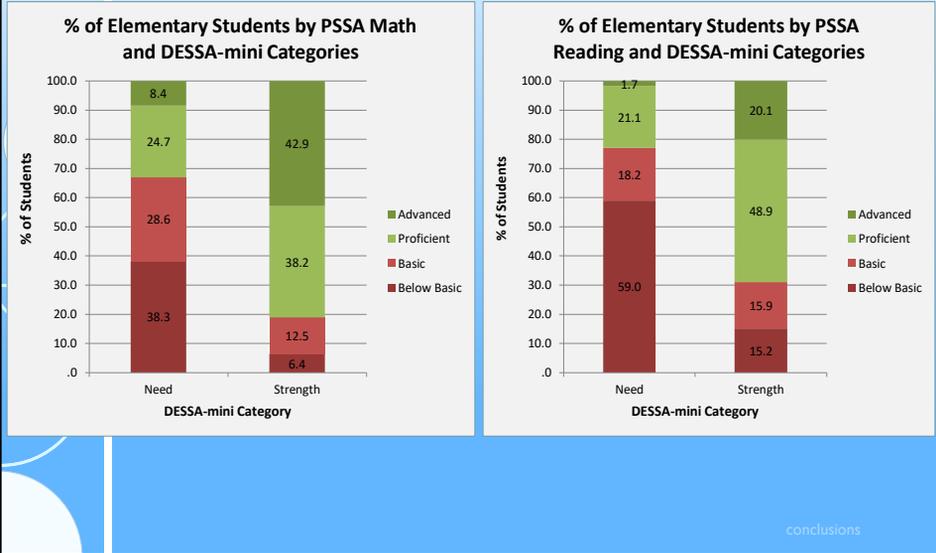
The Collaborative for Academic, Social, and Emotional Learning (CASEL) describes SEL as the process of developing the following five sets of core competencies in the context of safe, caring, well-managed, academically rigorous, and engaging learning environments:

- 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.<sup>1</sup>

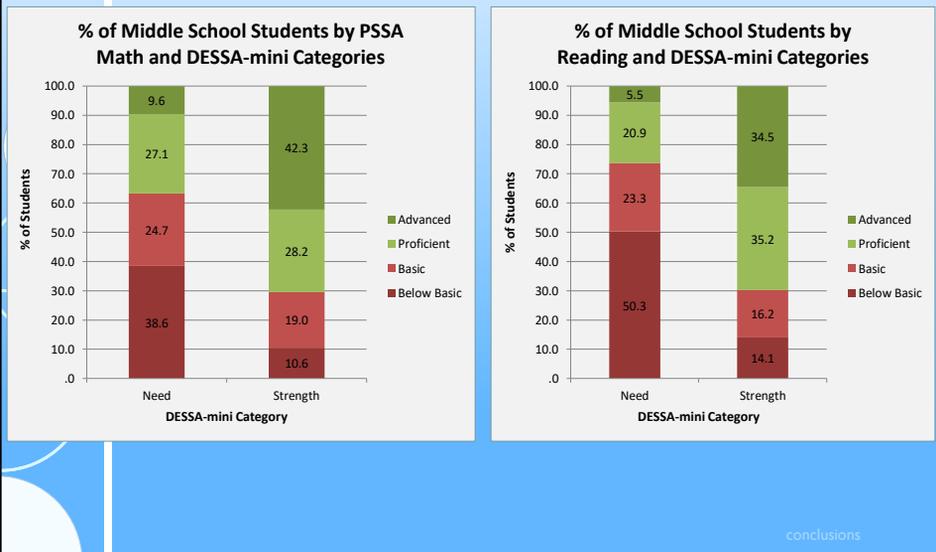
conclusions

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## Relationship Between Academic Achievement and Social-Emotional Competence



## Relationship Between Academic Achievement and Social-Emotional Competence



## Close Reading: What's SEL got to do with it? (Chicago Public Schools)

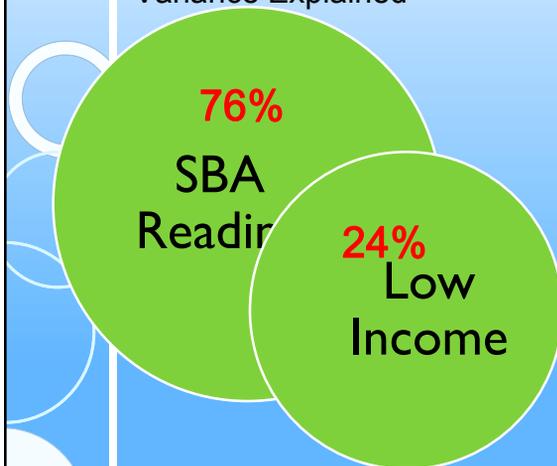
Close Reading is a set of strategies that allow students to productively struggle with complex text in ways that accelerate and deepen their learning.

| Elements of Close Reading Include:          | Self-Management skills required                                                                                                                                                                       | Relationship skills required                                                                                                                                        | Responsible Decision Making skills required                                                                                                                                                                                                                                                                |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Individual reading of complex text          | <ul style="list-style-type: none"> <li>• Self control</li> <li>• Self motivation</li> <li>• Perspective Taking</li> </ul>                                                                             | n/a                                                                                                                                                                 | n/a                                                                                                                                                                                                                                                                                                        |
| Group exploration of complex text           | <ul style="list-style-type: none"> <li>• Self control</li> <li>• Self motivation</li> <li>• Perspective Taking</li> <li>• Setting and Achieving goals</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Communicating clearly</li> <li>• Working collaboratively</li> <li>• Resolving conflicts</li> <li>• Seeking help</li> </ul> | <ul style="list-style-type: none"> <li>• Considering the well-being of self and others</li> <li>• Recognizing one's responsibility to behave ethically</li> <li>• Evaluating realistic consequences of various actions</li> </ul>                                                                          |
| Student-led discussion and analysis of text | <ul style="list-style-type: none"> <li>• Regulating one's emotions</li> <li>• Self control</li> <li>• Self motivation</li> <li>• Perspective Taking</li> <li>• Setting and Achieving goals</li> </ul> | <ul style="list-style-type: none"> <li>• Communicating clearly</li> <li>• Working collaboratively</li> <li>• Resolving conflicts</li> <li>• Seeking help</li> </ul> | <ul style="list-style-type: none"> <li>• Considering the well-being of self and others</li> <li>• Recognizing one's responsibility to behave ethically</li> <li>• Basing decisions on safety, social and ethical considerations</li> <li>• Evaluating realistic consequences of various actions</li> </ul> |



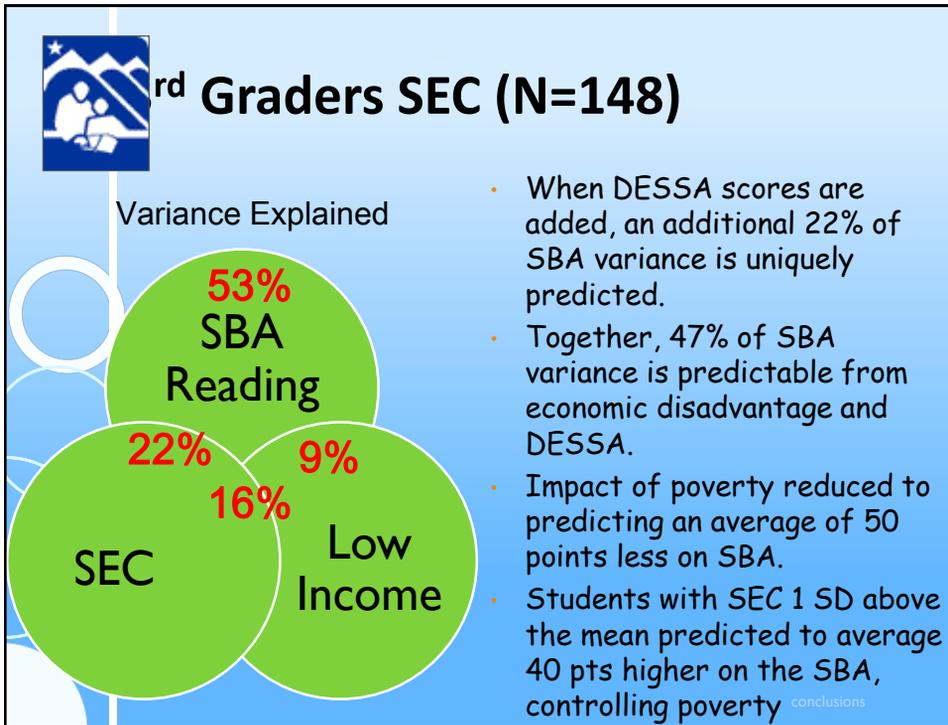
## rd Graders SEC (N=148)

Variance Explained



- Economic disadvantage explains approx 24% of SBA variance.
- Low income students predicted to average 80 pts lower on the SBA (1 SD).

conclusions



## Same Skills Needed in the Workplace

➤ Secretary's Commission on Achieving Necessary Skills (SCANS) Report -1999

- Skills needed by the workforce
- 50% (8 of 16) were social and emotional skills
  - Decision-making
  - Problem-solving
  - Personal responsibility
  - Sociability
  - Self-management
  - Integrity

conclusions

## Prediction of Challenging Behaviors

- Allentown Social Emotional Learning Initiative
  - approximately 12,000 students K-8<sup>th</sup> grade (ages 6-16)
- All students screened in October with the DESSA-Mini
  - 9,248 students
- Random 5 students/classroom assessed in October with DESSA
  - 1,960 students
- Analysis Sample (n=1875)

conclusions

## Sample Demographics

- Gender
  - 47% female
- Race/Ethnicity
  - 65% Hispanic/Latino
  - 17% Black/African American
  - 14% White/European American
  - 4% multi/other races (e.g., Asian/Pacific Islander American, Native American)

conclusions

## The Result

Students who were identified as having a Need for SEL Instruction in October were 4.5 times more likely to have a record of serious infraction by the end of the academic year as compared to those who were not identified as having a Need of Instruction in October ( $p < 0.001$ )

conclusions

## Kong (2013): IQ, SEL & Achievement

- Tiffany Kong studied CogAT, DESSA, and achievement scores for 276 elementary students grades K-8
- All gifted based on scores on verbal, quantitative, or nonverbal test scores at least 97th percentile

Socioemotional Competencies, Cognitive Ability,

and Achievement in Gifted Students

by

Tiffany Kong

A Dissertation Presented in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Philosophy

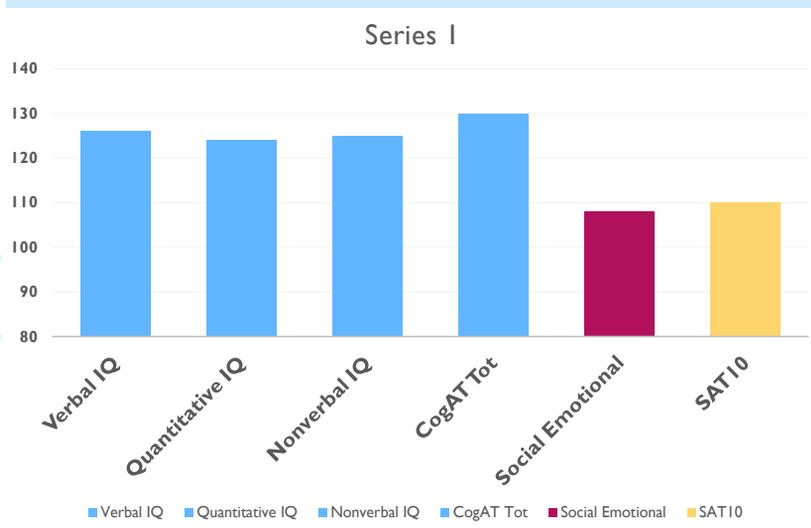
Approved November 2013 by the  
Graduate Supervisory Committee:

Linda Caterino Kulhavy, Chair  
Jack Naglieri  
Dina Brulles

conclusions

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## Ability, Social Emotional & Skills



conclusions

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## Kong (2013): IQ, SEL & Achievement

- DESSA Total correlated .44 and CogAT Total correlated .36 with Total Achievement (reading, math, language)
- A clearer picture of the relationships between IQ (CogAT) and SEL (DESSA) with achievement was obtained from hierarchical regression analysis...

conclusions

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## Kong (2013) SEL Predicts Beyond IQ (p. 44)

DESSA predicted reading, language and math scores over IQ (CogAt) scores

### Relations between Cognitive Ability, Socioemotional Competency, and Achievement Variables

Hierarchical regression analyses were conducted to determine which scales and subtests predicted the most variance in the dependent achievement variables. Composite CogAT scores were not found to significantly predict composite achievement,  $R^2\Delta = .03$ ,  $F(1, 121) = 3.27$ ,  $p > .05$ , reading, language, or math scores over-and-above the DESSA Total scores (Table 11). On the other hand, the DESSA Total scores significantly predicted composite achievement,  $R^2\Delta = .05$ ,  $F(1, 121) = 6.99$ ,  $p < .05$ ; language scores,  $R^2\Delta = .03$ ,  $F(1, 121) = 4.26$ ,  $p < .05$ ; and math scores,  $R^2\Delta = .05$ ,  $F(1, 121) = 6.09$ ,  $p < .05$ , over-and-above the composite CogAT scores.

conclusions

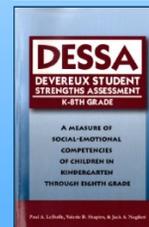
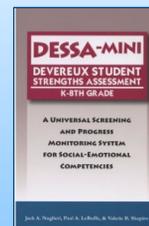
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## The DESSA Comprehensive System

- Universal screening with an 8-item, strength-based behavior rating scale, the *DESSA-mini* for universal screening and ongoing progress monitoring
- 72-item *DESSA* to find specific areas of need



Paul LeBuffe & Valerie Shapiro



conclusions

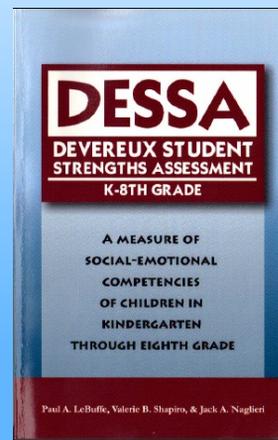
204

<http://www.centerforresilientchildren.org/>

The screenshot shows the homepage of the Devereux Center for Resilient Children. At the top, the logo "Devereux CENTER FOR RESILIENT CHILDREN" is on the left, and navigation links "Home | About Us | Testimonials | In The News | Newsletter | Contact Us" are on the right. Below the logo is a search bar and a menu with categories: "Overview", "Infants & Toddlers", "Preschool", "School-Age", and "Adults". The main content area features a video player with the text: "Mental health experts speak out on the importance of early childhood social and emotional screening, and their success with the Devereux Early Childhood Assessment Program." To the right of the text is a video thumbnail showing two young boys smiling. Below the video is a "Watch the video!" link. At the bottom, there are four featured content boxes: "INFORMATIONAL WEBINARS" with a woman at a computer, "DCRC RESOURCES" with "DVDs Assessment Strategies for Teachers Music RESILIENCE Research Web-based Families", "EVENT REGISTRATION" with a group of people, and "DECA-P2 DOWNLOADS" with a "NEW!" starburst and images of assessment materials.

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## Assessment of Social Emotional Skills with the DESSA



conclusions

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## 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-8<sup>th</sup> 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

conclusions

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## DESSA Norms

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

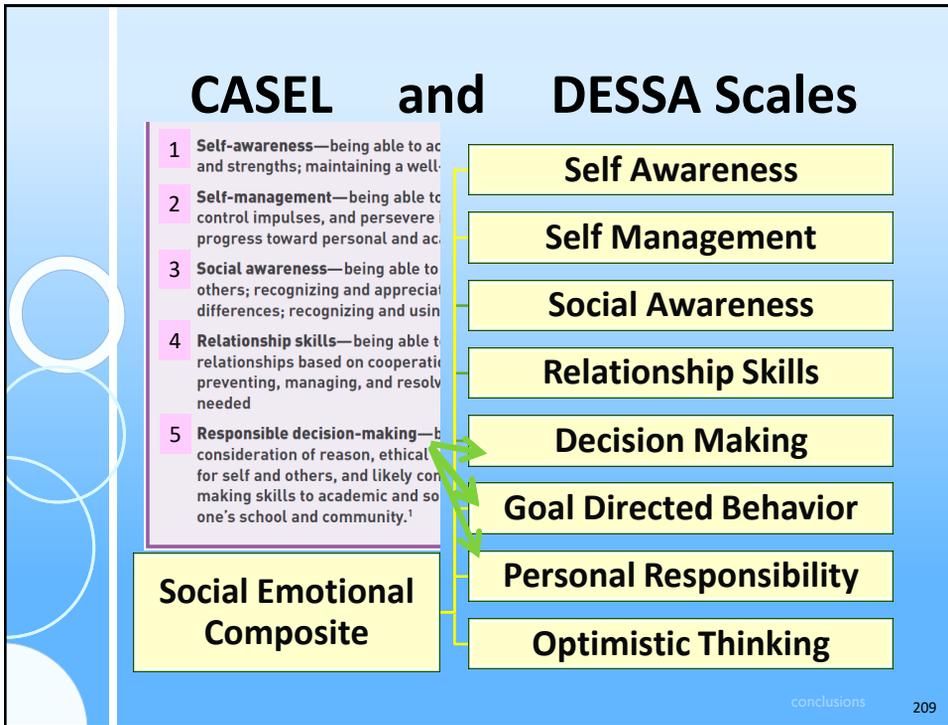
TABLE 2.1

DESSA Standardization Sample Characteristics by Grade and Gender

|                     | Males        |             | Females      |             | Total        |      |
|---------------------|--------------|-------------|--------------|-------------|--------------|------|
|                     | #            | %           | #            | %           | #            | %    |
| 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  |
| <b>Total Sample</b> | <b>1,226</b> | <b>49.5</b> | <b>1,249</b> | <b>50.5</b> | <b>2,475</b> |      |
| U.S. %              |              | 51.2        |              | 48.8        |              |      |

conclusions

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# Interventions for DESSA

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LEVELS: K12 Higher Ed Print Scanners Forms Social/Emotional Academics

## Evo Social & Emotional

An Apperson Evo Module

Apperson's Social & Emotional Learning (SEL) platform gives insight to student emotional competence and resiliency, and provides a framework for maximizing potential. Opportunity is everything.

[FREE TRIAL](#)

### Maximize the Benefits of Social & Emotional Learning.

MAKE A POSITIVE IMPACT ON STUDENTS' LIVES AND SOCIAL CLIMATE WITH RESEARCH-BASED TOOLS.

- IMPROVE ATTITUDES**  
Greater motivation to learn, commitment to school and classroom behavior.
- ENHANCE ACADEMICS**  
Higher test scores than students who did not receive SEL instruction.
- PROMOTE PROSOCIAL BEHAVIORS**  
Strength-based approaches encourage improved relationships.
- REDUCE EMOTIONAL DISTRESS**  
Fewer reports of student depression, anxiety, stress, and social withdrawal.
- DECREASE NEGATIVE BEHAVIORS**  
Decreased disruptive behaviors, noncompliance, aggression and disciplinary referrals.
- FOSTER RESILIENCE**  
Reduce risk factors and strengthen protective factors in the environment.

conclusions

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Strategies | SEL Plus Com...

https://sel.datainkevo.com/#/strategies

Apperson

**SEL+ Compass**

Welcome, Jen Fleming  
My Account | Forms | Support | Log Out

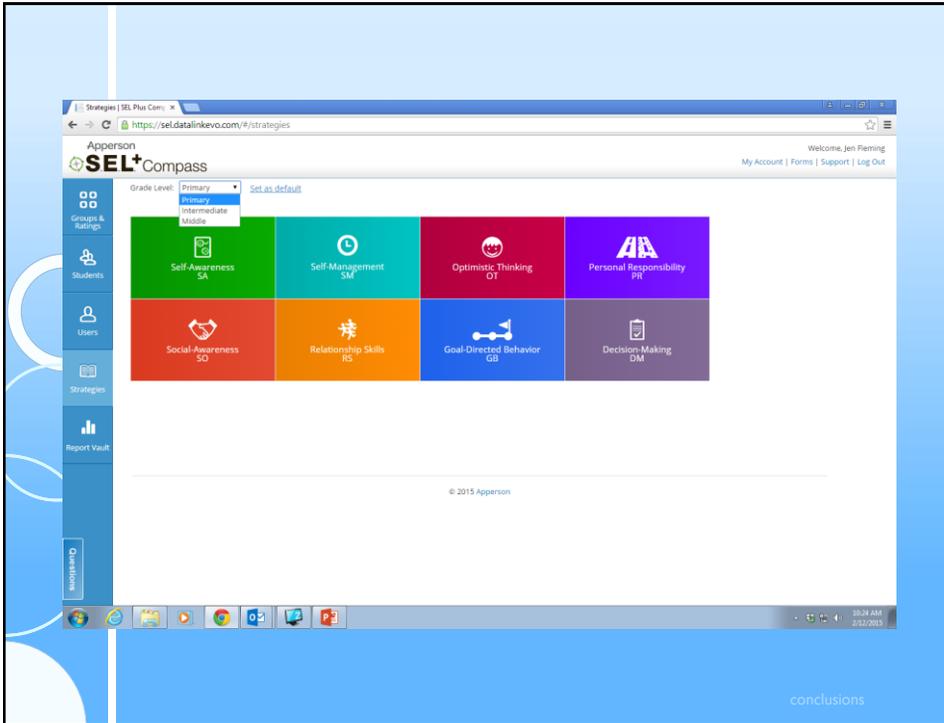
Grade Level: Primary Set as default

|                     |                        |                           |                            |
|---------------------|------------------------|---------------------------|----------------------------|
| Self-Awareness SA   | Self-Management SM     | Optimistic Thinking OT    | Personal Responsibility PR |
| Social-Awareness SO | Relationship Skills RS | Goal-Directed Behavior GB | Decision-Making DM         |

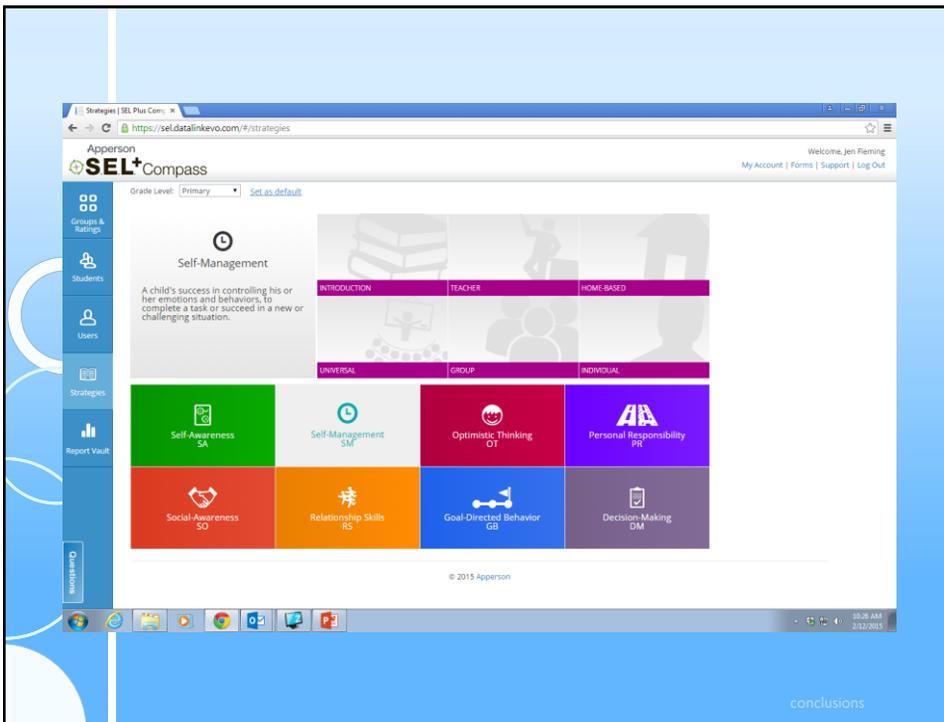
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10:23 AM 2/22/2015

conclusions



conclusions



conclusions

**Teacher Reflection: Setting Ourselves Is A Gift to Self and Others**

**Self-Management: being in control of our emotions and behaviors, accomplishing tasks, and succeeding in new and challenging situations.**

A variety of sources cite this rather astounding number: teachers make around 1,500 educational decisions each day. That's an average of about three decisions every minute—decisions involving content, relationships, safety, strategy. Decisions about how to approach a concept, how to reframe an idea to make it more understandable, who to call on first, and who to remember to come back to for a private conversation. Teaching has been listed as second only to air traffic control in the number of crucial decisions made all day, every day.

Is it any wonder that one of the vitally important aspects of being a successful, effective, and happy teacher is the ability to manage one's emotions? To remain clear-headed and confident under the pressure of constant decision-making, teachers must be able to regulate themselves, to regain composure again and again, all day long.

Maintaining a positive, calm classroom climate is key to student learning. And the best way to help others feel calm and settled is to calm and settle ourselves.

As one classroom teacher with over twenty years of experience put it, "I have a responsibility to be happy in the classroom because I set the tone. I want the students to be emotionally present, so my job is to be emotionally present. I need to take care of myself in ways that contribute to me being able to show up in that way."

Complete this [self assessment](#); then answer the reflection questions below on your journal or with a trusted colleague.

**Self assessment**  
Using a scale of 1 (rarely) to 5 (very frequently), privately respond to the questions below. Allow yourself time to think about concrete examples that help you decide on your rating.

- In pressured situations, I manage my emotions constructively (calm down, walk away, seek help). 1 2 3 4 5
- I am able to manage my difficult emotions in the moment (self talk, deep breaths). 1 2 3 4 5

conclusions

## 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

## EF and Academics

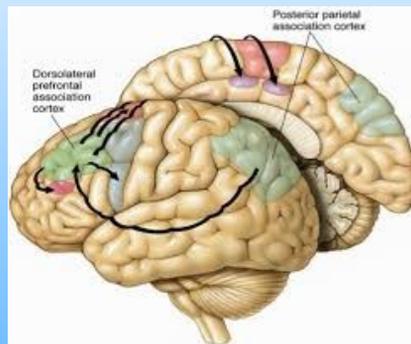
conclusions

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## CAS-2 Planning & Reading Comprehension

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

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

2  
1  
8

conclusions



## Far Word Recall: Word Planning

**PK-Grade 2**

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

**Grades 3+**

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

| Trial 2: Bicycle words          |                          |   |  | Intrusions |
|---------------------------------|--------------------------|---|--|------------|
| Item                            | □                        | R |  |            |
| chain                           | <input type="checkbox"/> | R |  |            |
| wheel                           | <input type="checkbox"/> | R |  |            |
| brake                           | <input type="checkbox"/> | R |  |            |
| 3 <sup>rd</sup> +<br>handlebars | <input type="checkbox"/> | R |  |            |

| Trial 2: Musical instruments |                          |   |  | Intrusions |
|------------------------------|--------------------------|---|--|------------|
| Item                         | □                        | R |  |            |
| drum                         | <input type="checkbox"/> | R |  |            |
| guitar                       | <input type="checkbox"/> | R |  |            |
| trumpet                      | <input type="checkbox"/> | R |  |            |
| 3 <sup>rd</sup> +<br>piano   | <input type="checkbox"/> | R |  |            |

| Trial 2: Fruits and vegetables |                          |   |  | Intrusions |
|--------------------------------|--------------------------|---|--|------------|
| Item                           | □                        | R |  |            |
| pepper                         | <input type="checkbox"/> | R |  |            |
| celery                         | <input type="checkbox"/> | R |  |            |
| tomato                         | <input type="checkbox"/> | R |  |            |
| 3 <sup>rd</sup> +<br>carrot    | <input type="checkbox"/> | R |  |            |

|                              |             |            |  |
|------------------------------|-------------|------------|--|
| <b>Trial 2<br/>subtotals</b> |             |            |  |
| Number<br>correct            | Repetitions | Intrusions |  |

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

|                                   |                   |             |            |
|-----------------------------------|-------------------|-------------|------------|
| <b>Trial 1<br/>subtotals</b>      |                   |             |            |
| <b>Trial 2<br/>subtotals</b>      |                   |             |            |
| +                                 |                   |             |            |
| =                                 |                   |             |            |
| <b>Word Recall<br/>(WR) total</b> | Number<br>correct | Repetitions | Intrusions |

## Silent Reading Fluency: Text Planning

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

2  
2  
0

conclusions

## How to Pair Far & CAS2

- **CAS2** - determine if there is a cognitive processing weakness (i.e. **Planning**) and whether that particular weakness directly impacts the academic skill in question (Reading Comprehension) on the FAR.
- **Far:** The **Silent Reading Fluency** has individual stories followed by sets of questions. The story is removed, and followed by 4 literal and 4 inferential questions. Pair with **Word Recall** to determine the extent of poor planning at both the word and text level.

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

2  
2  
1

conclusions

## Topical Outline

- Introduction to Traditional IQ
- IDEA and SLD
- A neuropsychological approach called PASS used to define “basic psychological process”
  - Using CAS2, FAR and FAM to identify SLD according to IDEA
- Which ability test to use?
- Which achievement test to use?
- Measure PASS and specific academic skills (FAR)
- Case studies

2  
2  
2

conclusions

## Rowan 4<sup>th</sup> grade: ADHD & Reading

| CAS-2                                                                                                                                                                                                 | COMPOSITE SCORE | RANGE         | PERCENTILE RANK |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|-----------------|
| <b>Planning:</b> the ability to apply a strategy, and self-monitor and self-correct performance while working toward a solution.                                                                      | 85              | Below Average | 16%             |
| <b>Attention:</b> the ability to selectively focus on a stimulus while inhibiting responses from competing stimuli.                                                                                   | 77              | Poor          | 6%              |
| <b>Simultaneous Processing-</b> is the ability to reason and problem solve by integrating separate elements into a conceptual whole, and often requires strong visual-spatial problem solving skills. | 105             | Average       | 63%             |
| <b>Successive Processing-</b> is the ability to put information into a serial order or particular sequence.                                                                                           | 100             | Average       | 50%             |
| <b>CAS-2 COMPOSITE SCORE</b>                                                                                                                                                                          | 87              | Below Average | 18%             |

2  
2  
3

## Rowan 4<sup>th</sup> grade: ADHD & Reading

| FAR COMPREHENSION INDEX                                                                                                                                                                                | Score  | Percentile | Descriptor               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|--------------------------|
| <b>Semantic Concepts</b> — a multiple choice test requiring the student to select the correct antonym or synonym of a target word.                                                                     | 95     | 37%        | Average                  |
| <b>Word Recall</b> — requires the student to repeat back a list of words over a series of two trials. The second trial requires the student to recall a word from a selected list.                     | 82     | 11%        | Below Average            |
| <b>Morphological Processing</b> — a multiple choice test requiring students to choose the correct prefix, suffix, or stem that best completes an incomplete target word.                               | 90     | 25%        | Average                  |
| <b>Silent Reading Fluency</b> — requires the student to silently read a passage, and then answer a series of literal and inferential questions about the story. Reading rate is also recorded as well. | 75     | 5%         | Moderately Below Average |
| <b>FAR COMPREHENSION INDEX</b>                                                                                                                                                                         | 84+/-8 | 14%        | Below Average            |
| <b>WIAT III Reading Comprehension</b>                                                                                                                                                                  | 96     | 39%        | Average                  |

2  
2  
4

conclusions

## SLD Eligibility

- Discrepancy/Consistency Method (Naglieri & Otero, 2017)
  - is based on theoretically defined measures of neurocognitive processes rather than traditional IQ achievement discrepancy
  - and combined with academic test scores to form a Pattern of Strengths and Weaknesses

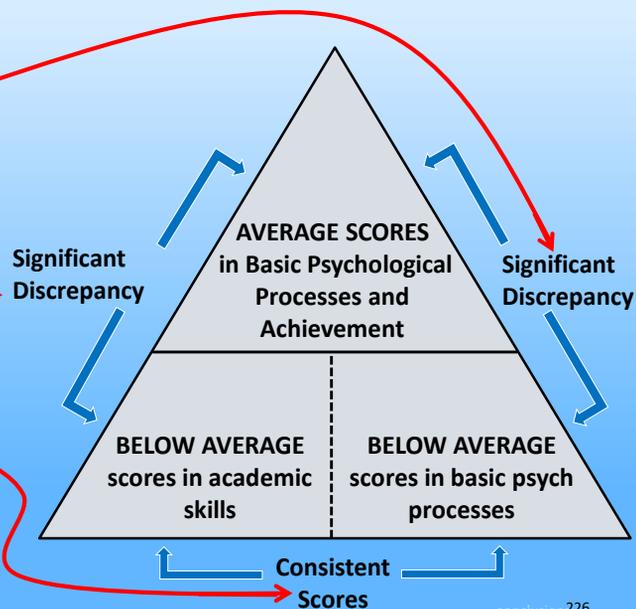
NASP 2018 Symposium

conclusions

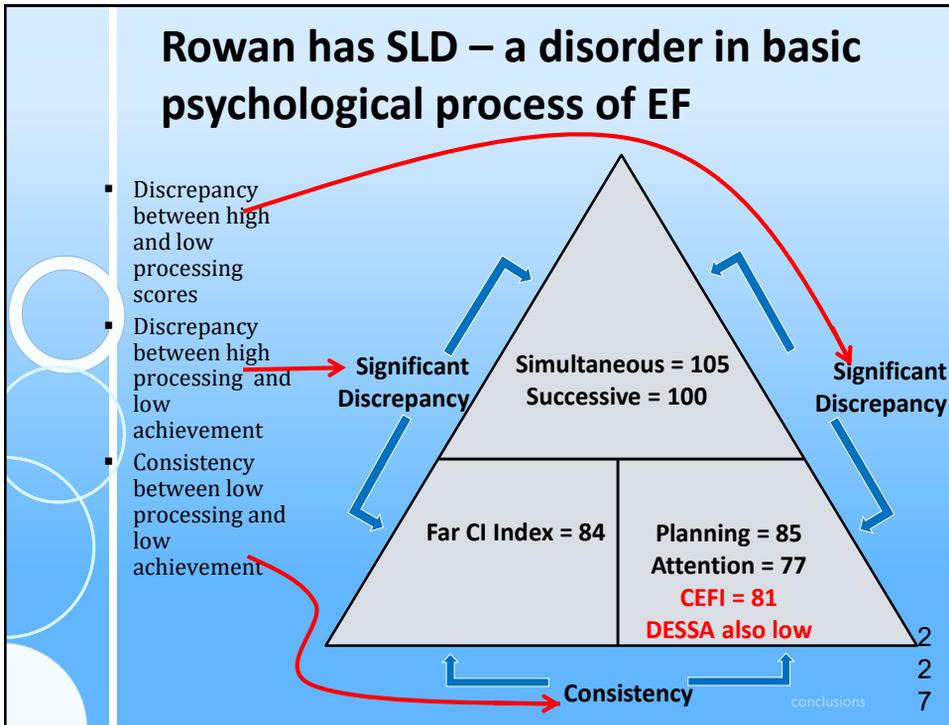
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## Discrepancy Consistency Method for SLD

- **Discrepancy #1** between high and low processing scores
- **Discrepancy #2** between high processing and low achievement
- **Consistency** between low processing and low achievement



conclusion226



## Planning Interventions

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

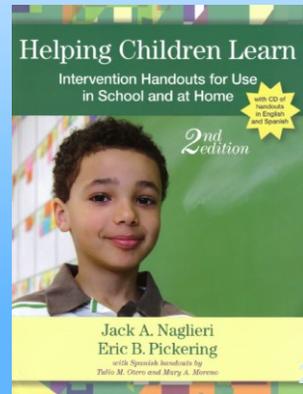
2  
2  
8

conclusions

## Planning Interventions

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

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



conclusions

2  
2  
9

## 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
- Impairment and EF
- 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

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## Rating Scale of Impairment & EF

### ➤ EF and Impairment ...



conclusions

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## Definition of Impairment

- “Impairment is a reduced ability to meet the demands of life because of a psychological, physical, or cognitive condition” (Goldstein & Naglieri, 2016, p. 6).
- The American Psychiatric Association in the new DSM-5 (APA, 2013) emphasizes impairment over and above symptom presentation.
- World Health Organization’s International Classification of Functioning, Disability and Health (WHO, 2001) also has guidelines for impairment.

conclusions

## Standardization

- RSI Normative Sample:
  - **2800** ratings
    - **800** ratings for each of the RSI (5-12 Years) Parent and Teacher forms
    - **600** ratings for each of the RSI (13-18 Years) Parent and Teacher forms
- Within **1% the 2010 U.S. Census** targets on:
  - Race/ethnicity,
  - Region,
  - PEL
- Includes 11.6%-11.8% of clinical cases

conclusions

## RSI Forms and Scores

| RATING SCALE OF IMPAIRMENT (RSI)                                        |                                                                  |                                                                                           |                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| RSI (5-12 YEARS)                                                        |                                                                  | RSI (13-18 YEARS)                                                                         |                                                                  |
| PARENT FORM                                                             | TEACHER FORM                                                     | PARENT FORM                                                                               | TEACHER FORM                                                     |
| Number of Items: 41<br>Reading Level: 5.8<br>Admin Time: 10 mins.       | Number of Items: 29<br>Reading Level: 6.6<br>Admin Time: 5 mins. | Number of Items: 49<br>Reading Level: 5.9<br>Admin Time: 10 mins.                         | Number of Items: 29<br>Reading Level: 6.6<br>Admin Time: 5 mins. |
| <b>RSI Scales</b><br>School<br>Social<br>Mobility<br>Domestic<br>Family | <b>RSI Scales</b><br>School<br>Social<br>Mobility                | <b>RSI Scales</b><br>School/Work<br>Social<br>Mobility<br>Domestic<br>Family<br>Self-Care | <b>RSI Scales</b><br>School<br>Social<br>Mobility                |
| TOTAL SCORE                                                             | TOTAL SCORE                                                      | TOTAL SCORE                                                                               | TOTAL SCORE                                                      |

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## Factorial Support for RSI Scales

- Exploratory and confirmatory factor analyses confirm the RSI structure
  - 5 factors: School, Social, Mobility, Domestic, and Family for the RSI (5–12 Years) Parent Form
  - 6 factors: School/Work, Social, Mobility, Domestic, Family, and Self-Care) for the RSI (13–18 Years) Parent Form
  - 3 factors: School, Social, and Mobility) for the RSI (5–12 Years) and RSI (13–18 Years) Teacher Forms.

conclusions

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## RSI and EF correlations (Manual pg. 115)

| RSI Total Score             |                                            |                       |                                             |
|-----------------------------|--------------------------------------------|-----------------------|---------------------------------------------|
| Adaptive Behavior           |                                            | Symptom Scales        |                                             |
| -.54                        | Adaptive Behavior Assessment System-II     | .26                   | Conners CBRS — Content Scales               |
|                             |                                            | .29                   | Conners CBRS — Symptom Scales               |
| Social-Emotional Competency |                                            | Ability & Achievement |                                             |
| -.71                        | Devereux Student Strength Assessment       | -.05                  | Wechsler Intelligence Scale for Children-IV |
| Symptom Scales              |                                            | -.06                  | Woodcock Johnson III Achievement            |
| -.78                        | Comprehensive Executive Function Inventory | -.03                  | Cognitive Assessment System                 |



Guidance on  
Evaluation and Eligibility  
for the  
Special Education Process

### Educational Identification and Medical Diagnosis

Prescriptions, diagnosis, or reports issued by licensed medical professionals, using medical diagnosis and classification systems such as the International Statistical Classification of Diseases and Related Health Problems (ICD) and Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> Edition (DSM 5), must be considered but are not sufficient to make an eligibility determination. The group must consider information from multiple sources that documents the presence of an impairment, the adverse impact on educational performance, and the need for specially designed instruction.

When a medical diagnosis is presented, groups should address the difference between educational identification under IDEA and medical diagnosis and review the criteria for the specific disability category mandated by the Virginia special education regulations.

Students may meet the criteria for educational identification as a child with a disability under one of the federal disability categories without having a medical diagnosis. It is also possible for a student to have a medical diagnosis but not meet the criteria for an educational identification as a child with a disability.

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## Presentation Outline

- Comprehensive Model of EF
  - Historical Perspective
  - Definitions of Executive Function
- EF as Behavior
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- EF as Social Emotional Skills
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-  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

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## Executive Function Behaviors, Intelligence, and Achievement test scores

conclusions

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## EF and Achievement (Naglieri & Rojahn, 2004)

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

Copyright 2004 by the American Psychological Association, Inc.  
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 con-

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

conclusions

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## 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.

conclusions

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## 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            | 14.4              | 8            | 18.6              | 9            | 15.5 |
| <b>Total</b>                    | <b>62</b>                          | <b>100.0</b> | <b>43</b>         | <b>100.0</b> | <b>58</b>         | <b>100.0</b> |      |
| <b>Age M (SD)</b>               | <b>10.4 (2.9)</b>                  |              | <b>10.2 (2.6)</b> |              | <b>10.5 (2.7)</b> |              |      |

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

conclusions

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## EF Behaviors (CEFI) & CAS

|                   | CAS        |            |            |            |            |
|-------------------|------------|------------|------------|------------|------------|
|                   | FS         | Plan       | Sim        | Att        | Suc        |
| <b>CEFI</b>       |            |            |            |            |            |
| <b>Full Scale</b> | <b>.45</b> | <b>.49</b> | <b>.43</b> | <b>.37</b> | <b>.32</b> |

|                   | WISC-IV    |            |            |            |            |
|-------------------|------------|------------|------------|------------|------------|
|                   | FS         | VC         | PR         | WM         | PS         |
| <b>CEFI</b>       |            |            |            |            |            |
| <b>Full Scale</b> | <b>.39</b> | <b>.44</b> | <b>.27</b> | <b>.30</b> | <b>.34</b> |

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

conclusions

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## 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

conclusions

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## Sex Differences in Executive Function

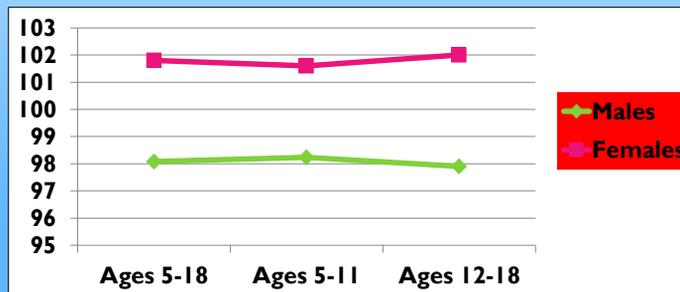
conclusions

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## CEFI Sex Differences: Parent Raters

➤ Girls are Smarter than Boys

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



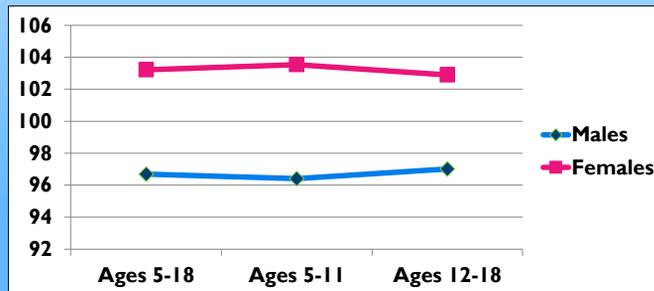
conclusions

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## CEFI Sex Differences: Teacher Raters

➤ Girls are Smarter than Boys

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

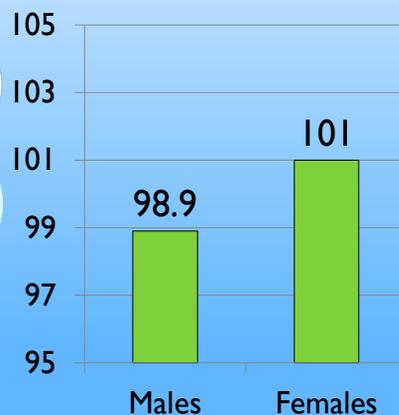


conclusions

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## Gender Differences: Self Raters

➤ Girls are better EF than Boys



|        | Mean  | SD   | N   |
|--------|-------|------|-----|
| Male   | 98.9  | 15.4 | 350 |
| Female | 101.0 | 14.6 | 350 |

conclusions

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# Sex Differences: Ability

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

Copyright 2001 by the American Psychological Association, Inc.  
0022-0663/01/\$5.00 DOI: 10.1037/0022-0663.93.2.430

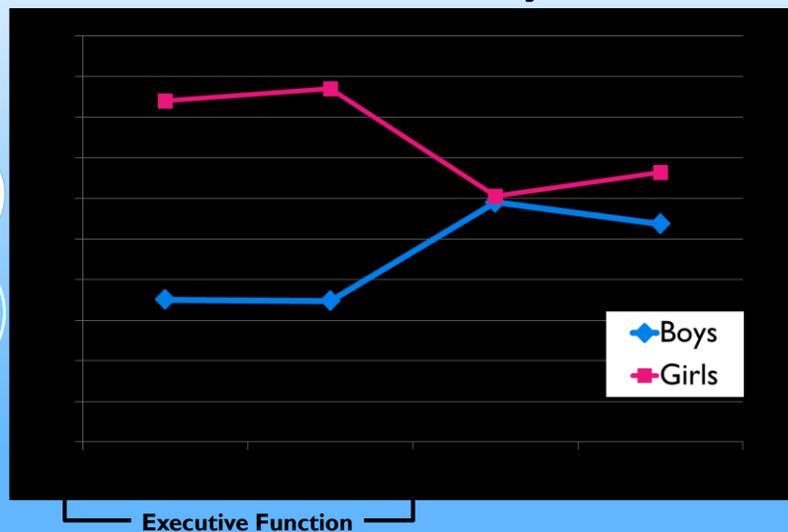
## Gender Differences in Planning, Attention, Simultaneous, and Successive (PASS) Cognitive Processes and Achievement

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 Profiling ( $d = .33$ ), 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.

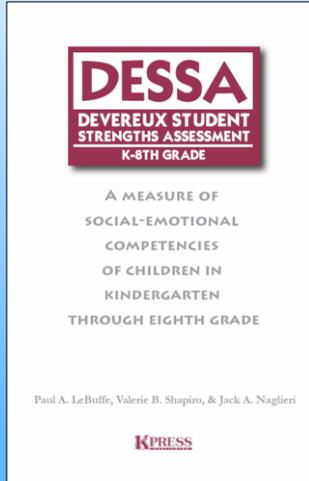
# Sex Differences: Ability



conclusions

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# Sex Differences: Social Emotional



**TABLE 2.6**  
Means, SDs, Ns, and d-ratios for DESSA T-Scores by Gender

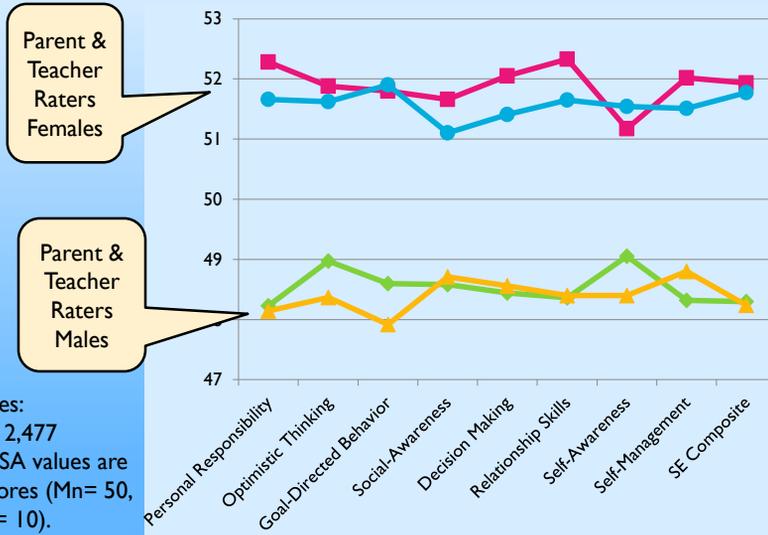
|                            | Males |       |     | Male<br>Female<br>d-ratio | Females |      |     |
|----------------------------|-------|-------|-----|---------------------------|---------|------|-----|
|                            | Mean  | SD    | n   |                           | Mean    | SD   | n   |
| <b>TEACHER RATERS</b>      |       |       |     |                           |         |      |     |
| Personal Responsibility    | 48.23 | 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   | 9.38 | 611 |
| Social-Awareness           | 48.58 | 10.13 | 630 | -0.31                     | 51.66   | 9.64 | 612 |
| Decision Making            | 48.44 | 10.08 | 631 | -0.37                     | 52.05   | 9.32 | 612 |
| Relationship Skills        | 48.36 | 10.04 | 630 | -0.41                     | 52.33   | 9.30 | 612 |
| Self-Awareness             | 49.05 | 10.28 | 631 | -0.22                     | 51.17   | 9.36 | 611 |
| Self-Management            | 48.32 | 10.02 | 631 | -0.39                     | 52.02   | 9.18 | 612 |
| Social-Emotional Composite | 48.30 | 10.09 | 625 | -0.38                     | 51.93   | 9.02 | 609 |
| <b>PARENT RATERS</b>       |       |       |     |                           |         |      |     |
| Personal Responsibility    | 48.14 | 9.52  | 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     | 47.92 | 9.51  | 602 | -0.41                     | 51.90   | 9.96 | 641 |
| Social-Awareness           | 48.71 | 9.75  | 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                     | 51.65   | 9.90 | 641 |
| Self-Awareness             | 48.40 | 10.03 | 602 | -0.32                     | 51.54   | 9.51 | 641 |
| Self-Management            | 48.80 | 9.98  | 602 | -0.27                     | 51.51   | 9.94 | 641 |
| Social-Emotional Composite | 48.24 | 9.51  | 602 | -0.37                     | 51.77   | 9.60 | 641 |

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

conclusions

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# Sex Differences: Social Emotional



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

conclusions

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## Sex Differences

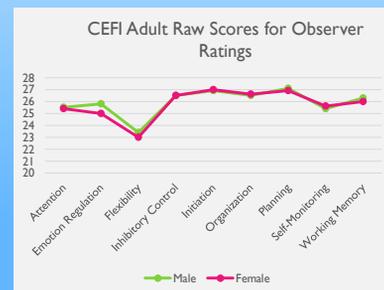
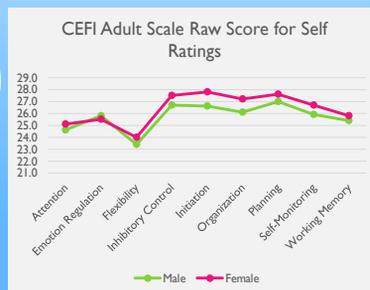


conclusions

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## CEFI Adult Sex Differences

- Negligible gender differences (median Cohen's  $d$  effect size was 0.15) were found for the CEFI Adult
  - CEFI Adult Full Scale male female  $d$  was -0.12 for self ratings and 0.03 for observer ratings



conclusions

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# Developmental Differences in Executive Function

conclusions

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## Developmental Changes in EF

Contents lists available at ScienceDirect



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Learning and Individual Differences

journal homepage: [www.elsevier.com/locate/lindif](http://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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<sup>a</sup> Department of Psychology, University of Georgia, Athens, GA, 30602-3013, USA

<sup>b</sup> Department of Psychology, San Francisco State University, San Francisco, CA, 94132, USA

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### ARTICLE INFO

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Childhood  
Adolescence

### ABSTRACT

This study examined age-related changes in complex executive function (EF) in a large, representative sample ( $N=2036$ ) aged 5 to 17 using the Cognitive Assessment System (CAS; Naglieri & Das, 1997a). Relations between complex EF and academic achievement were examined on a sub-sample ( $N=1395$ ) given the Woodcock-Johnson Tests of Achievement-Revised (Woodcock & Johnson, 1989). Performance on the three complex EF tasks improved until at least age 15, although improvement slowed with increasing age and varied some across tasks. Moreover, the different developmental patterns in the correlations between completion time and accuracy provide clues to developmental processes. Examination of individual achievement subtests clarified the specific aspects of academic performance most related to complex EF. Finally, the correlation between complex EF and academic achievement varied across ages, but the developmental pattern of the strength of these correlations was remarkably similar for overall math and reading achievement, suggesting a domain-general relation between complex EF and academic achievement.

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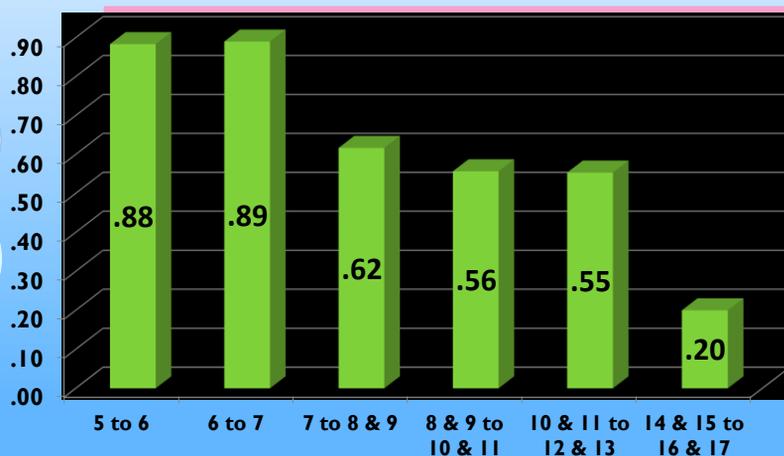
## Developmental Changes in EF

- 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)

conclusions

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## Developmental Changes in EF



conclusions

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## Developmental Changes in EF

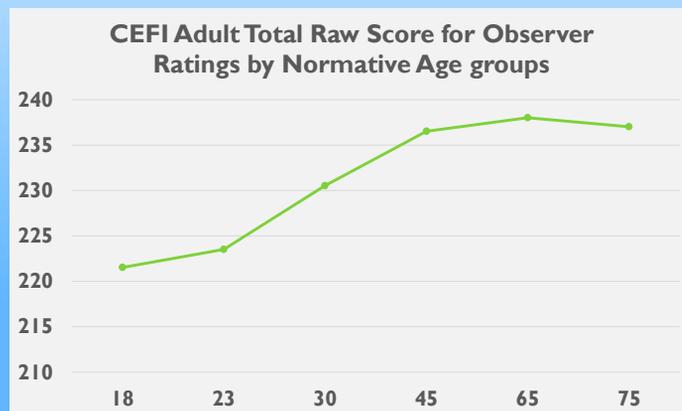
- These developmental data suggest that instruction in EF Skills should be stressed when growth is most rapid, that is, during early elementary and middle school years
- Students need to be TOLD what EF is and how it can be used to help them learn, especially during the early years when growth in ABILITY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

conclusions

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## CEFI Adult by Age

- Observer Forms, small age differences were found on the Full Scale and all scale scores except Flexibility and Working Memory (effect sizes ranging from .010 to .026), with differences also being significant for Emotion Regulation, Inhibitory Control, Initiation, Organization and Planning scales ( $p < .01$ ).



conclusions

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# EF Lessons for High School

conclusions 261



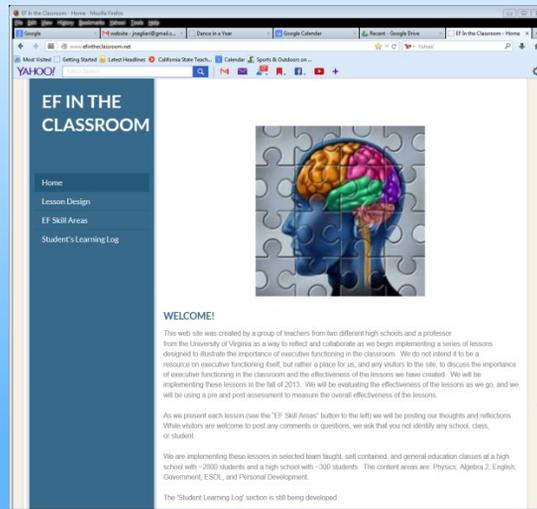
## Presentation Outline

- 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 262

# www.efintheclassroom.net

- Start with Awareness of thinking about thinking

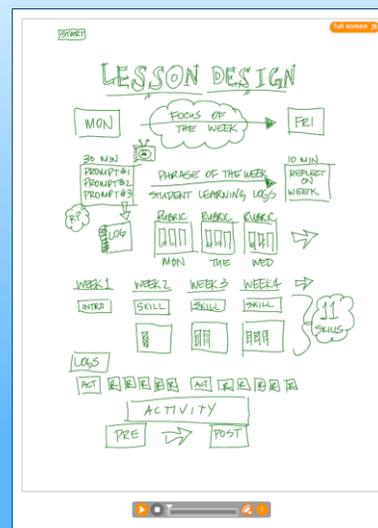


conclusions

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## Structure of the lessons

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



conclusions

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## EF Lesson Plan *Themes*

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

conclusions

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## EF Posters in the Class



## Mountain View Alternative HS



conclusions

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## Introductory Lesson: "Are you Aware"

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



conclusions

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## Introductory Lesson: “Are you Aware”



conclusions

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## Other Lessons from www.efintheclassroom.net

[www.Efintheclassroom.net](http://www.Efintheclassroom.net)

Research support?

**EF IN THE CLASSROOM**

Home  
Lesson Design  
EF Skill Areas  
Student's Learning Log

**WELCOME!**

This web site was created by a group of teachers from five different high schools and a professor from the University of Virginia in a way to reflect and collaborate as we begin implementing a series of lessons designed to illustrate the experience of executive functioning in the classroom. We do not intend it to be a resource on executive functioning itself, but rather a place for us, and any visitors to the site, to discuss the importance of executive functioning in the classroom and the effectiveness of the lessons we have created. We will be implementing these lessons in the fall of 2015. We will be evaluating the effectiveness of the lessons as we go, and we will be using a pre and post assessment to measure the overall effectiveness of the lessons.

As we present each lesson (see the "EF Skill Areas" button to the left) we will be posting our thoughts and reflections. While visitors are welcome to post any comments or questions, we ask that you not identify any school, class, or student.

We are implementing these lessons in selected team taught, self contained, and general education classes at a high school with 2000 students and a high school with 1000 students. The current areas are: Physics, Algebra 2, English, Government, ESOL, and Personal Development.

The "Student Learning Log" section is still being developed.

conclusions

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# 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.

conclusions

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# 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 (Schieff, 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

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

page 1 of 2

Helping Children Learn: Intervention Handouts for Use in School and at Home, Second Edition, by Jack A. Naglieri & Eric B. Pickering  
Copyright © 2010 by Paul W. Brockle Publishing Co., Inc. All rights reserved.

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conclusions

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

HAMMILL INSTITUTE  
ON DISABILITIES

Journal of Learning Disabilities  
44(2) 184-195  
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sagepub.com/journalsPermissions.nav  
DOI: 10.1177/0022219410391190  
<http://journaloflearningdisabilities.sagepub.com>



Jackie S. Iseman<sup>1</sup> and Jack A. Naglieri<sup>1</sup>

### Abstract

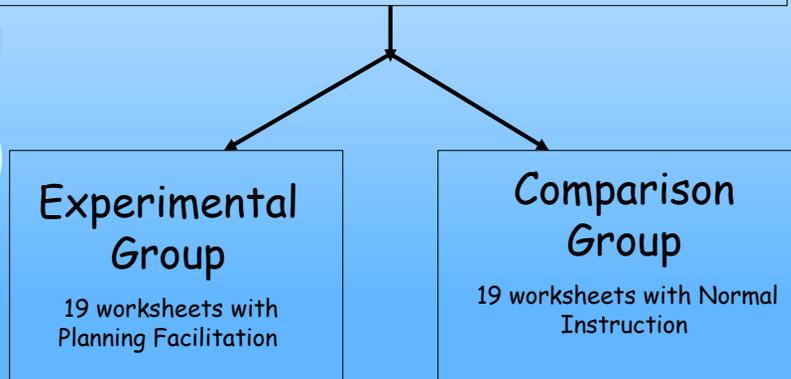
The authors examined the effectiveness of cognitive strategy instruction (Successive) given by special education teachers to students with ADHD. The experimental group were exposed to a brief cognitive strategy instruction that focused on development and application of effective planning for mathematical computation. Standardized tests of cognitive processes (Wechsler Intelligence Scale) and math worksheets completed throughout the experimental period. At 1 year follow-up, the experimental group continued to outperform the control group. Large pre-post effect sizes were found for students in the experimental group (0.85 and 0.26), Math Fluency (1.17 and 0.09), and Numerical Operations (1.17 and 0.09). At 1 year follow-up, the experimental group continued to outperform the control group. Students with ADHD evidenced greater improvement in math worksheets (which measured the skill of generalizing learned strategies to other situations) when provided the PASS-based cognitive strategy instruction.



## Design of the Study

### Experimental and Comparison Groups

7 worksheets with Normal Instruction



conclusions

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## Instructional Sessions

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

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

conclusions

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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

conclusions

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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?

conclusions

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## Student Plans

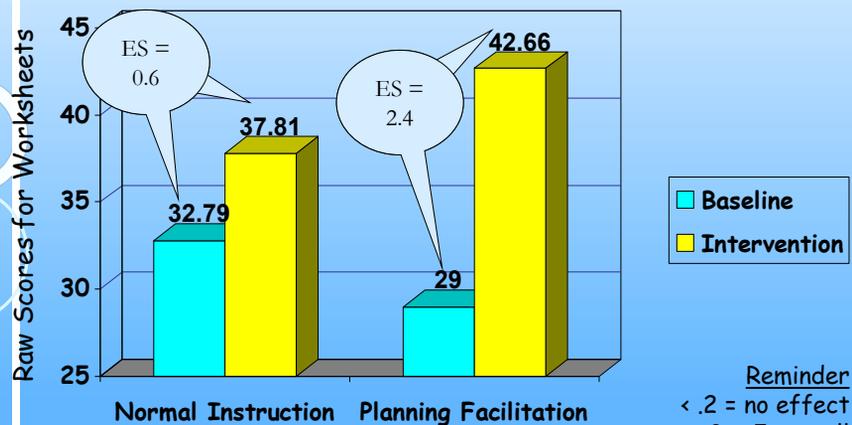
- “My goal was to do all of the easy problems on every page first, then do the others.”
- “I do the problems I know, then I check my work.”
- “I do them (the algebra) by figuring out what I can put in for X to make the problem work.”
- “I did all the problems in the brain-dead zone first.”
- “I try not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



conclusions

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## Worksheet Means and Effect Sizes for the Students with ADHD

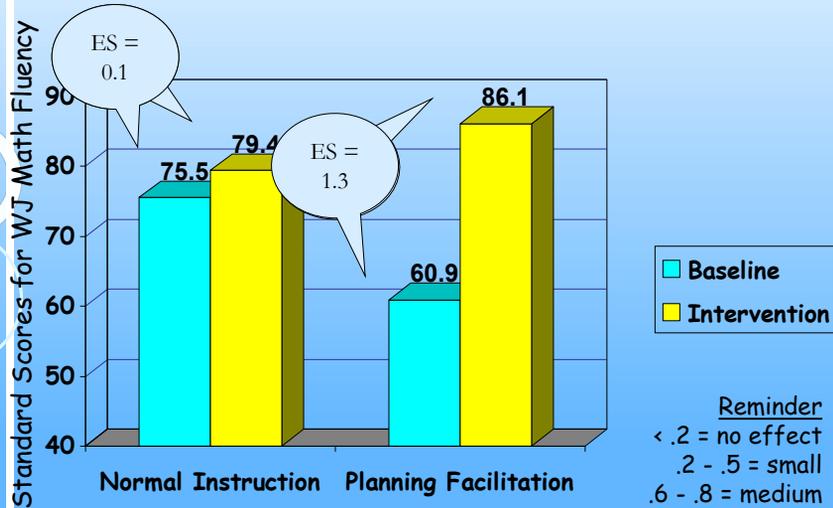


**Reminder**  
 < .2 = no effect  
 .2 - .5 = small  
 .6 - .8 = medium  
 > .8 = large

conclusions

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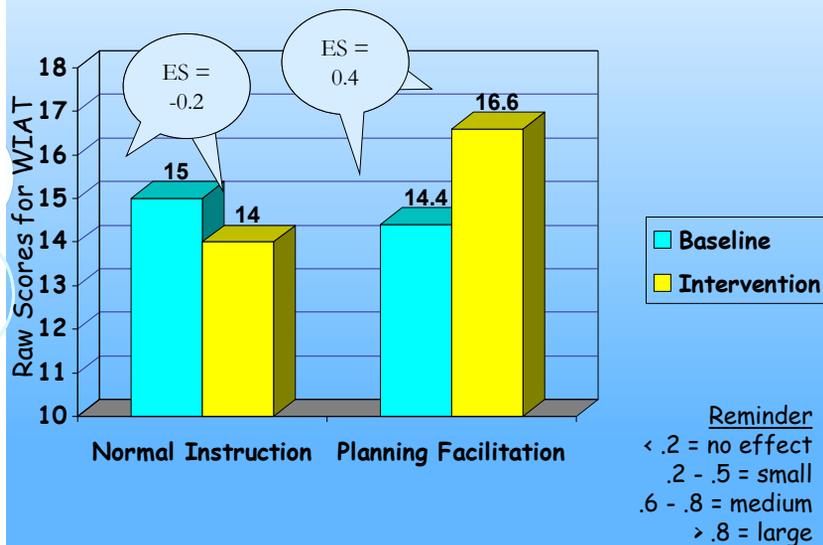
## WJ Math Fluency Means and Effect Sizes for the Students with ADHD



conclusions

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## WIAT Numerical Operation Means and Effect Sizes for Students with ADHD

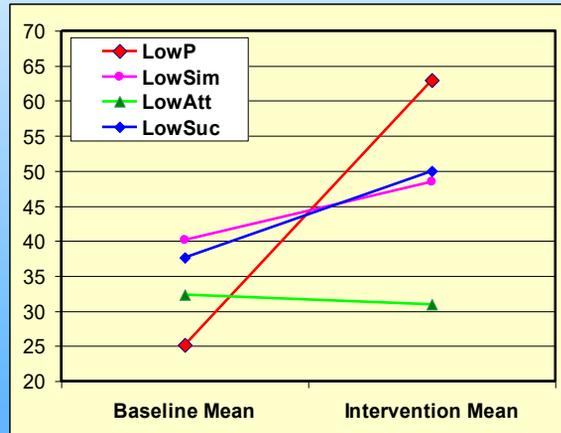


conclusions

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## Iseman (2005)

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



conclusions

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

conclusions

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## 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)

conclusions

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## EF and Reading Comprehension

*Journal of Psychoeducational Assessment*  
2005, 21, 282-289

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

Frederick A. Haddad  
*Kyrene School District, Tempe, Arizona*

Y. Evie Garcia  
*Northern Arizona University*

Jack A. Naglieri  
*George Mason University*

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

The purpose of this study was to evaluate whether instruction designed to facilitate planning would have differential benefit on reading comprehension depending on the specific Planning, Attention, Simultaneous, and Successive (PASS) cognitive characteristics of each child. A sample of 45 fourth-grade general education children was sorted into three groups based on each PASS scale profile from the Cognitive Assessment System

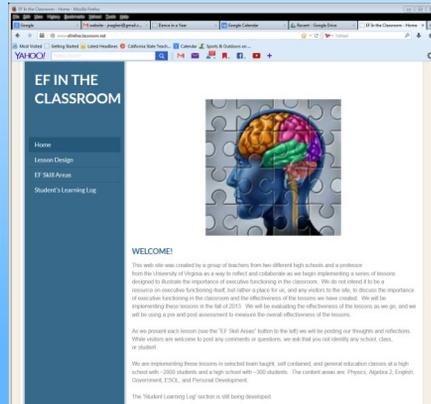
instructional level was determined, a cognitive strategy instruction intervention was conducted. The children completed a reading comprehension posttest at their respective instructional levels after the intervention. Results showed that children with a Planning weakness ( $n = 13$ ) benefited substantially (effect size of 1.52) from the instruction designed to facilitate planning. Children with no weakness ( $n = 21$ ; effect size = .52) or a

conclusions

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# Other Lessons from www.efintheclassroom.net

## Working Memory Lesson



conclusions

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## Time to Think and Talk

➤ Task:

START

**4**

**minutes  
left**

➤ Your own questions and thoughts..



conclusions

## 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

conclusions

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## Low EF and an Enabled Society



conclusions

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## Stuck on the Escalator

- “A student in 4<sup>th</sup> 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.”

conclusions

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## HOW TO EMPOWER STUDENTS WE ASSESS

conclusions

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## Two Mindsets



### Fixed mindset:

- ❖ Effort will not make a difference
- ❖ You either get it or you don't



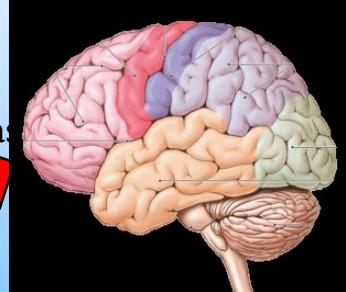
### Growth mindset:

- ❖ Enjoy effort and the process of learning
- ❖ You can always grow and learn

conclusions

## Mindsets + Skillsets = Results

- Mindsets & Skillsets include
  - Brain-based concepts such as
    - Executive Function
    - Metacognition
    - Self-Regulation
  - **These concepts are all closely related to the **FRONTAL LOBES** of the brain.**



conclusions

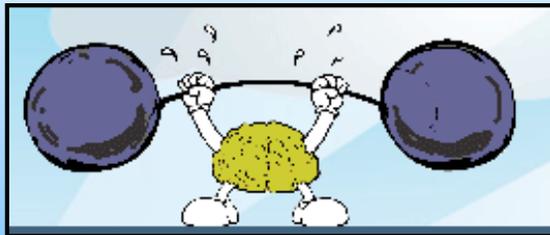
294

## Teach Kids About Their Amazing Brains!



conclusions

Dweck's web site: [www.brainology.us](http://www.brainology.us)



**“The growth mindset...reveals *that thinking skills can be developed*, and expertise can be built by means of deliberate practice.”**

conclusions

## Formula for Success (Kryza, 2013)

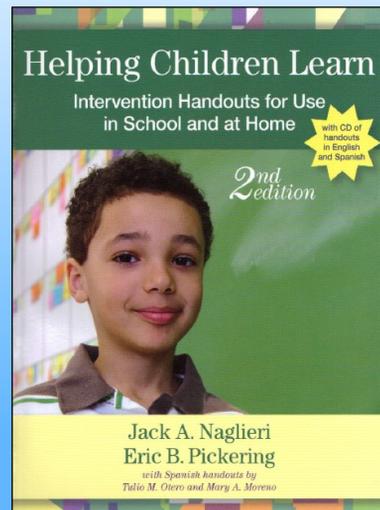
**Mindsets** plus **Skill Sets** equals **RESULTS!**



PG. 12

## Teaching Children to use EF

- 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.



conclusions

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## CEFI Scales and Intervention

- CEFI yields 9 separate content scales
- Use these for treatment planning and treatment evaluation

### CEFI Scales

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

conclusions

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## Step 1 – Talk with Students

### How to Be Smart: Planning

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

#### What Does Being Smart Mean?

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

## 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.

### Think smart and use a plan!



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!

## 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-- 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

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## Conclusions

- The teacher's role is to give students 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**

conclusions

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