

## LEARNER OBJECTIVES

### **WEBINAR – Introduction to Executive Function**



Learners of this webinar will:

1. Develop an understanding of Executive Function (EF)
2. Understand the brain/body connection
3. Recognize the impact of the brain/body connection on behavior
4. Recognize ways to assess executive function.

This material was developed under a grant from the Colorado Department of Education. The content does not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government.

The content of this material was developed under an agreement from the Federal Department of Education to the Kansas Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Kansas Department of Education or the Federal Government. TASN Autism and Tertiary Behavior Supports does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Deputy Director, Keystone Learning Services, 500 E. Sunflower, Ozawie, KS 66070, [785-876-2214](tel:785-876-2214).

The contents of this power point presentation were developed under a grant from the Nebraska Department of Education, IDEA parts B and C from the U.S. Department of Education. However, this content does not necessarily represent the policy of the U.S. Department of Education and you should not assume endorsement by the Federal Government.

## Tri-State Autism Spectrum Disorder Webinar Series



This material was developed under a grant from the Colorado Department of Education. The content does not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government.

The content of this material was developed under an agreement from the Federal Department of Education to the Kansas Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Kansas Department of Education or the Federal Government. TASN Autism and Tertiary Behavior Supports does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Deputy Director, Keystone Learning Services, 500 E. Sunflower, Ozawie, KS 66070, [785-876-2214](tel:785-876-2214).

The contents of this power point presentation were developed under a grant from the Nebraska Department of Education, IDEA parts B and C from the U.S. Department of Education. However, this content does not necessarily represent the policy of the U.S. Department of Education and you should not assume endorsement by the Federal Government.

Tri State Webinar Series 2015-2016

## Polling Questions

- Questions will be asked throughout the webinar
- When the poll opens on your screen respond by clicking on or filling in your answer.

What is your role?

What is your role?

☐ Administrator

☐ Parent/Family Member

☐ Related Service Professional

☒ Teacher

☐ Other

☐ No Vote

What state are you from?

What state are you from?

☐ Colorado

☐ Kansas

☐ Nebraska

☐ Other

☒ No Vote

Tri State Webinar Series 2015-2016

# TRI-STATE WEBINAR SERIES

## INTRODUCTION TO EXECUTIVE FUNCTION

Presented by: Sharon Krupa-Sirotek, Ph.D.  
Content Collaborator: Dawna Sigurdson, Ed.S.



Tri State Webinar Series 2015-2016

### Presenter Information



Sharon Krupa-Sirotek, Ph.D. LLC  
Licensed Clinical and School Psychologist  
Colorado Department of Education:  
Autism Regional Trainer/Consultant



Dawna Sigurdson  
School Psychologist  
Nebraska Central Region  
Autism Spectrum Disorders Coordinator



Tri State Webinar Series 2015-2016

## Learner Objectives

Learners will:

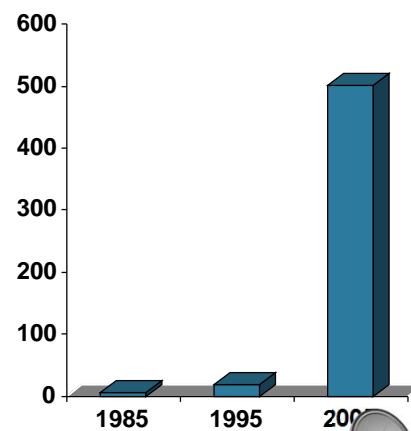
- Develop an understanding of Executive Function (EF)
- Understand the brain/body connection
- Recognize the impact of the brain/body connection on behavior
- Recognize ways to assess executive function.



Tri State Webinar Series 2015-2016

## Interest in Executive Function in Children

- 5 articles in 1985
- 14 articles in 1995
- 501 articles in 2005
  - Bernstein & Waber, Executive Function in Education, 2007



BRIEF: Behavior Rating Inventory of Executive Function, PAR, Inc, 2015

## Presentation Summary

Executive Function (EF) is an umbrella term comprising a wide range of cognitive processes often called higher order thinking that are responsible for managing and directing mental, emotional and behavioral functions. (Chan, 2007)

We will be reviewing executive functions, examining the brain/body connection, assessments of EF and EF skills and deficits.



Tri State Webinar Series 2015-2016



Tri State Webinar Series 2015-2016



Tri State Webinar Series 2015-2016



## Executive Function (EF)

- The term includes a vast array of higher order thinking:
- Cognitive process: problem solving, planning, sequencing, ability to sustain attention, resistance to interference, cognitive flexibility, initiation, organization, verbal reasoning, self-monitoring and working memory.
- Emotional Self-regulation: capacity to control one's impulses, regulation of emotional reactions, regulation of social behavior

Tri State Webinar Series 2015-2016



## Polling Question

- To understand the construct of Executive Function, think
  - A. The Air Traffic Control Tower in a busy airport
  - B. The conductor of a major symphony orchestra
  - C. An Umbrella term that encompasses a vast array of higher order thinking
  - D. manages and directs mental, emotional and behavioral functions
  - E. All of the above



Tri State Webinar Series 2015-2016

## EXECUTIVE FUNCTION

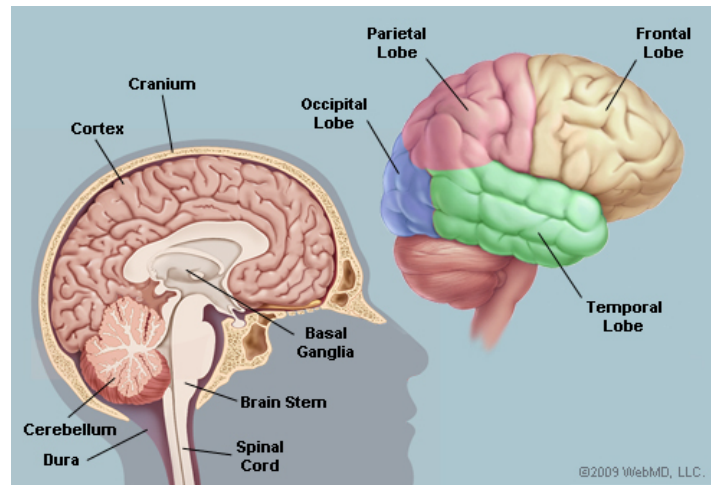
---

Understanding  
the Brain/Body Connection



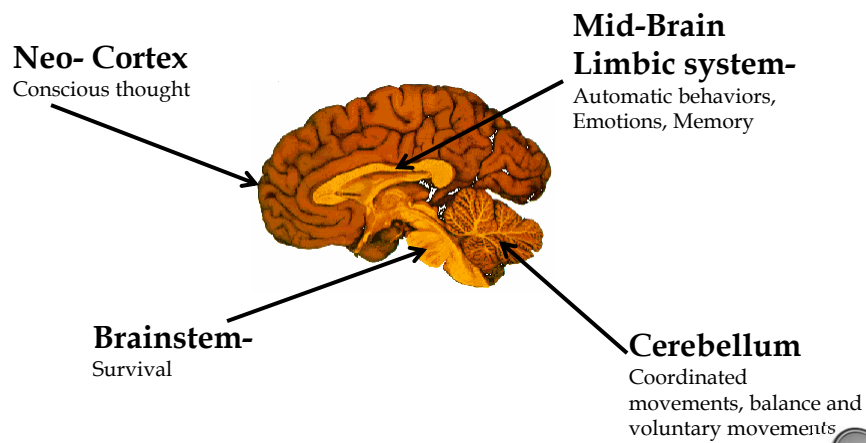
Tri State Webinar Series 2015-2016

## Appreciating the Brain



Tri State Webinar Series 2015-2016

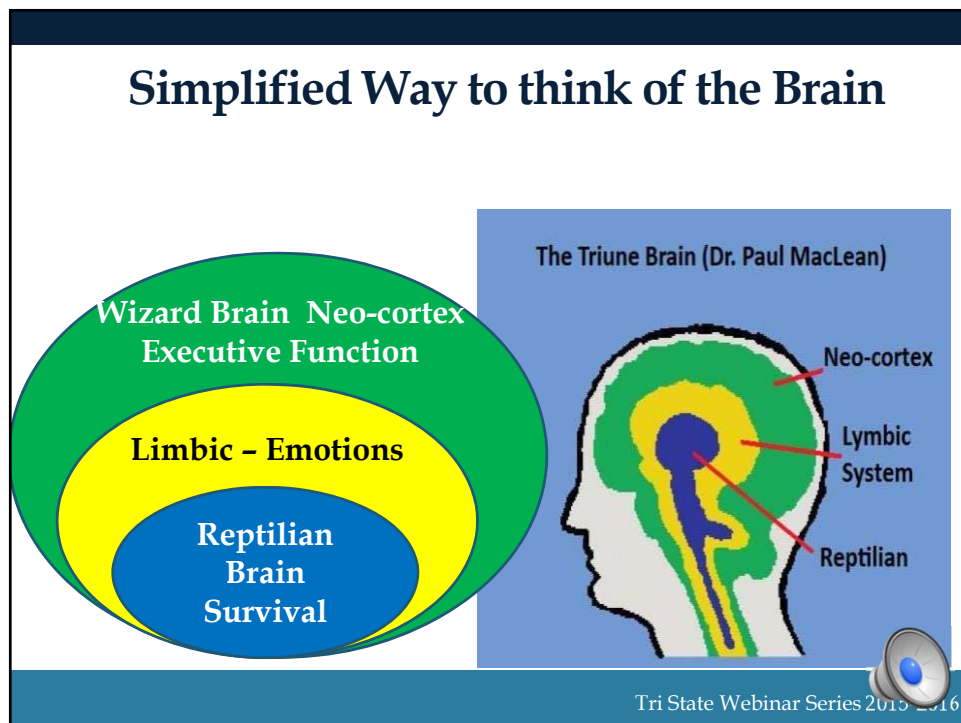
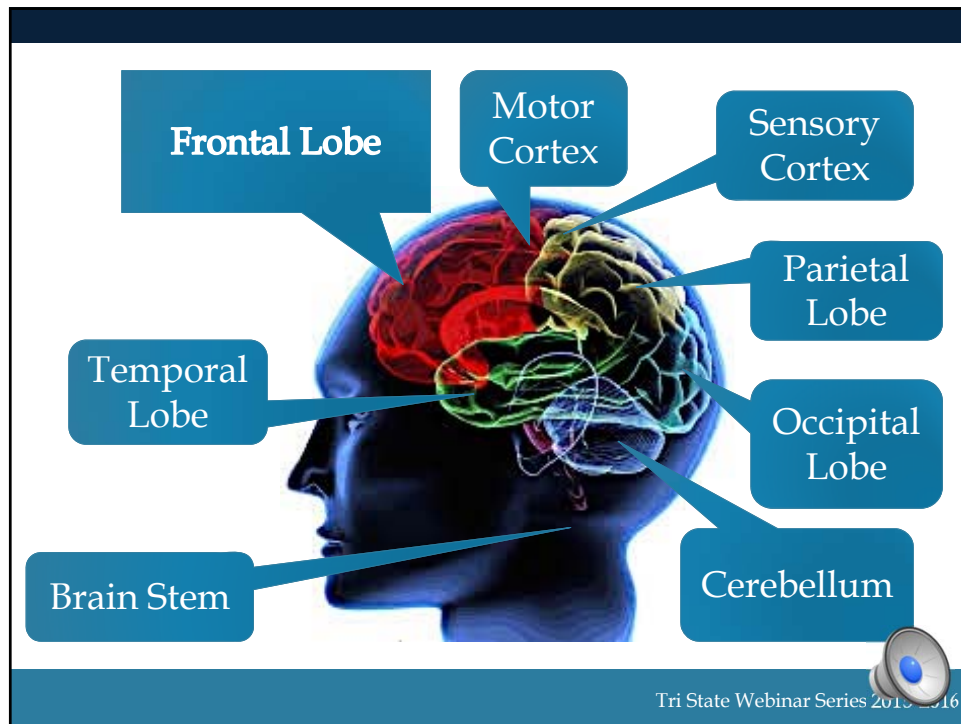
## Executive Function & the BRAIN



August 2012

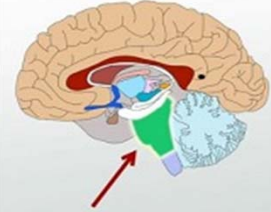
<http://jillkuzma.wordpress.com>







**BRAIN STEM**

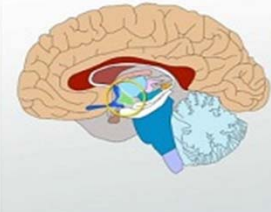


**Brain Stem**  
regulates:

- heart rate
- breathing
- blood pressure
- swallowing
- digestion

Education-Portal.com

**HYPOTHALAMUS**



**Hypothalamus**  
controls:

- internal thermostat
- hunger
- thirst
- fight or flight response
- rest and digest response
- mating behavior

Education-Portal.com

**PRIMITIVE/REPTILIAN  
BRAIN**

**“LIZARD BRAIN”**

**SURVIVAL**

**INSTINCTS**


**Fight**

**Flight**

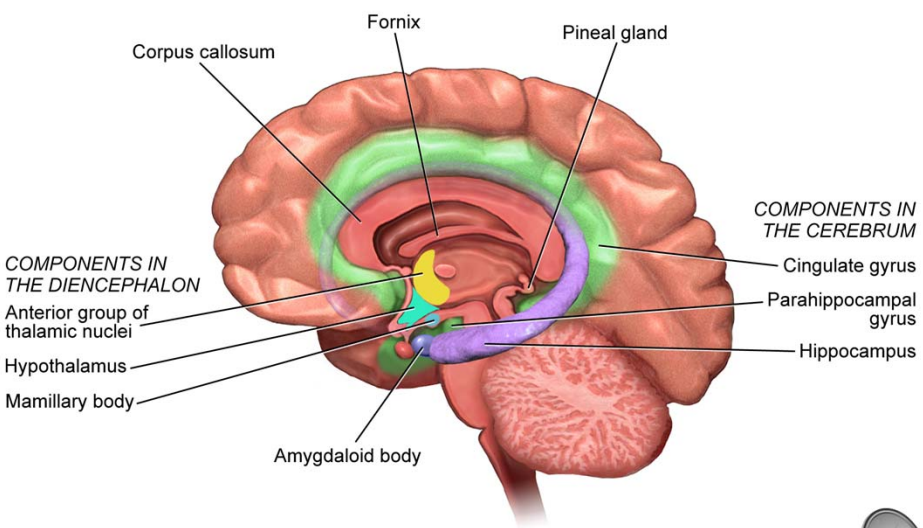
**Freeze**

**Food**

**Reproduction**



## The Limbic System




**COMPONENTS IN THE DIENCEPHALON**

- Anterior group of thalamic nuclei
- Hypothalamus
- Mammillary body

**COMPONENTS IN THE CEREBRUM**

- Cingulate gyrus
- Parahippocampal gyrus
- Hippocampus
- Amygdaloid body

Tri State Webinar Series 2015-2016



## Cerebral Cortex: WIZARD BRAIN HIGHER ORDER THINKING = Executive Function



Problem Solving  
Reasoning  
Understanding  
Inference  
Analysis  
Prediction  
Creating



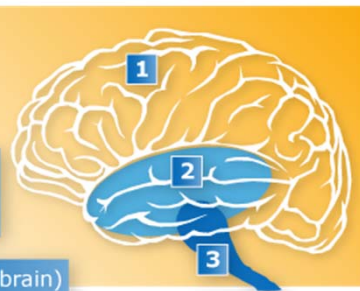
Wizard Brain

- 1 Neocortex
  - thoughts
  - meanings
  - logic
  - associations
  - feelings about feelings

- 2 Middle brain (limbic system)
  - simple emotions

- 3 Brainstem (reptile brain)
  - fight or flight
  - autonomic functions
  - appetite

Lizard Brain



<http://dmangus.blogspot.com>



Tri State Webinar Series 2015-2016

## Polling Question 2

The human brain is a remarkably complex organ.

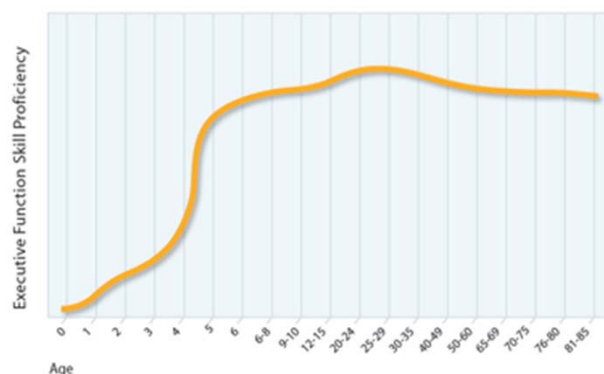
It is responsible for all thought, all movement and all emotions.

A way to understand the complex workings of the brain is to think of the lower, primitive, instinctual reactions, i.e, flight or fight as \_\_\_\_\_ and higher order, problem solving, rational behavior as \_\_\_\_\_.

- A. Lizard Brain and Wizard Brain
- B. Chicken Brain and Scientist Brain

Tri State Webinar Series 2015-2016

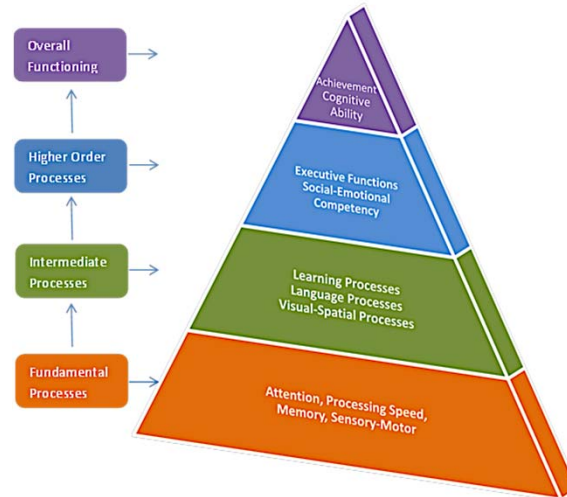
## When do Executive Function Skills Develop?



Center on the Developing Child, Harvard University

Tri State Webinar Series 2015-2016

# Hierarchy of Neurocognitive Development

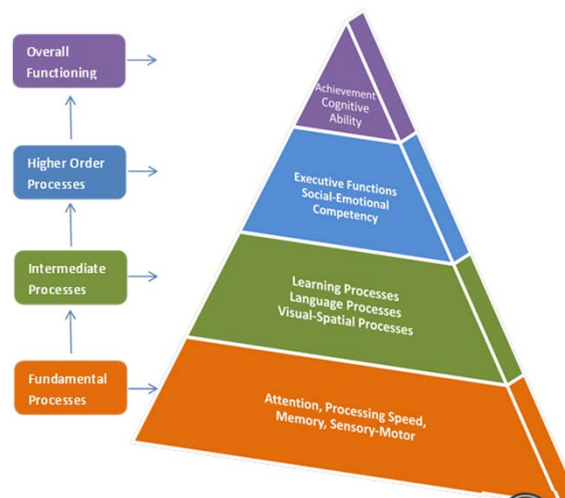


[www.cdc.state.co.us/cdesped/tbi\\_manual\\_braininjury](http://www.cdc.state.co.us/cdesped/tbi_manual_braininjury), Adapted from Miller, Halstead-Reitan

23

## Fundamental Processes

- Attention
- Processing Speed
- Memory
- Sensory-Motor:
  - Fine Motor
  - Gross Motor



Adapted from Miller, Halstead-Reitan

24

## Intermediate Processes

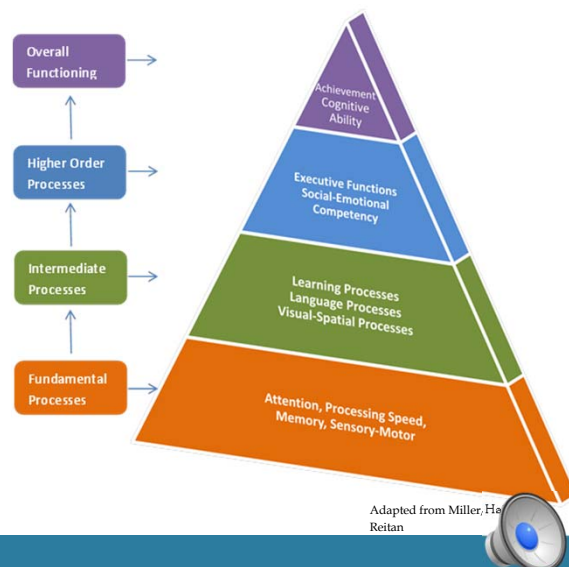
- New Learning
- Language/Communication
  - Receptive
  - Expressive
  - Social/Pragmatics
- Visual-Spatial Skills



25

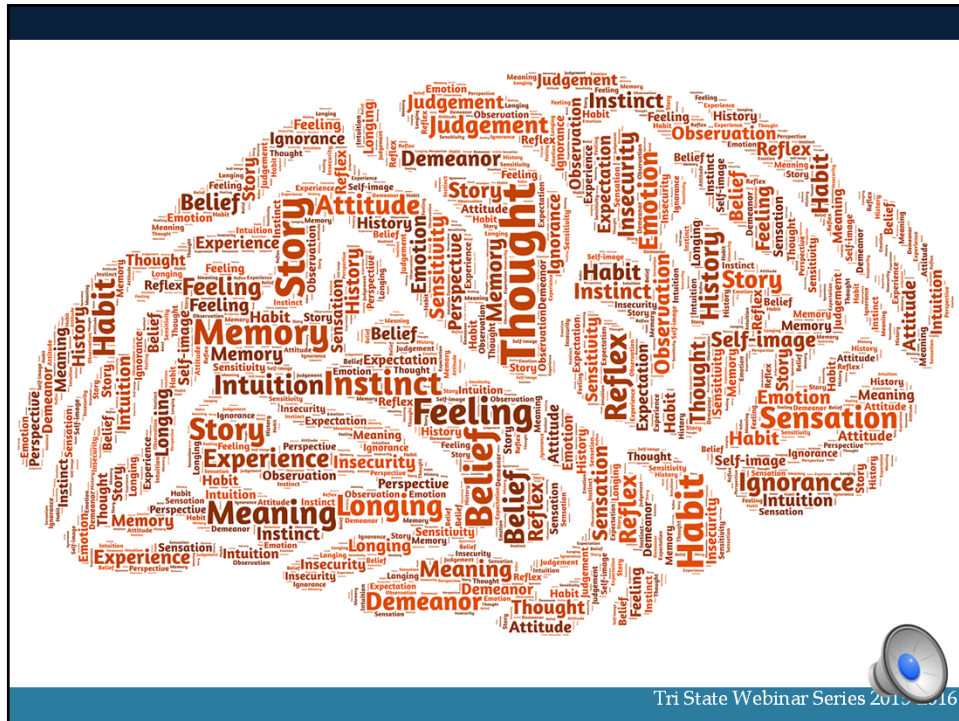
## Higher Order Processes

- Executive Functions
  - Initiation
  - Organization
  - Planning
  - Working Memory
  - Emotional Control
  - Problem Solving



26





# ASSESSMENT OF EXECUTIVE FUNCTION

Tri State Webinar Series 2015-2016



## Assessment of Executive Function

- Executive Function is a large domain, so it important to be clear, exactly what are you assessing and for what purpose?
- Executive Function embodies a wide scope of cognitive skills. No single measure will provide an accurate estimate of an entire person's executive function capacities.
- Also many of the checklists are not directly measuring an individual's skills, rather getting the judgment of the child's teachers or parents.



Tri State Webinar Series 2015-2016

## Assessment of Executive Function (EF)

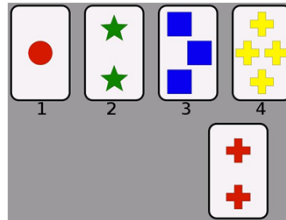
- In past, EF was assessed through performance tests, out of a history of assessing brain dysfunction and traumatic brain injury.
- In the past, assessments included the Wechsler Intelligence Scales of neuro-psychological batteries such as the Halstead - Reitan Neuropsychological Battery.
- Or various non-verbal measures



Tri State Webinar Series 2015-2016

## Popular Past Measures

- Wisconsin Card Sorting Test



- Stoop Test of Color Naming

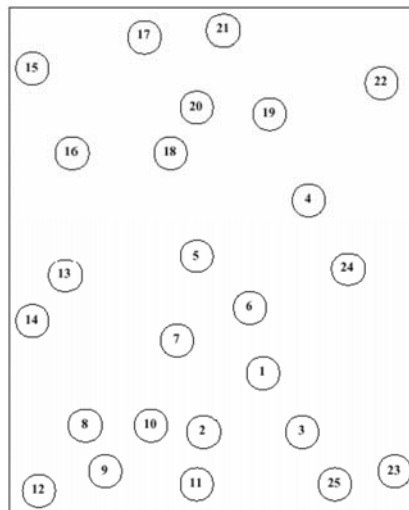


Tri State Webinar Series 2015-2016



### Trail Making Test Part A

Patient's Name: \_\_\_\_\_ Date: \_\_\_\_\_



inar Series 2015-2016



## Tests for Cognitive Functions

- Behavior Rating Inventory of Executive Function (BRIEF)
- Continuous Performance Test (CPT)
- Das-Naglieri Cognitive Assessment System (DN: CAS)
- D-KEFS (Delis Kaplan Executive Function System)
- Kaufman Assessment Battery for Children (KABC-II)
- NEPSY-II A Developmental Neuropsychological Assessment (NEPSY-II)



Tri State Webinar Series 2015-2016

## Tests for Cognitive Functions

- Test of Everyday Attention for Children (TEA-Ch)
- Test of Memory and Learning (TOMAL-2)
- Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V)
- Wide Range Assessment of Memory and Learning – Second Edition (WRAML-2)
- Wisconsin Card Sorting Test (WCST)
- Woodcock Johnson IV: Tests of Cognitive Abilities (WJIV: COG)



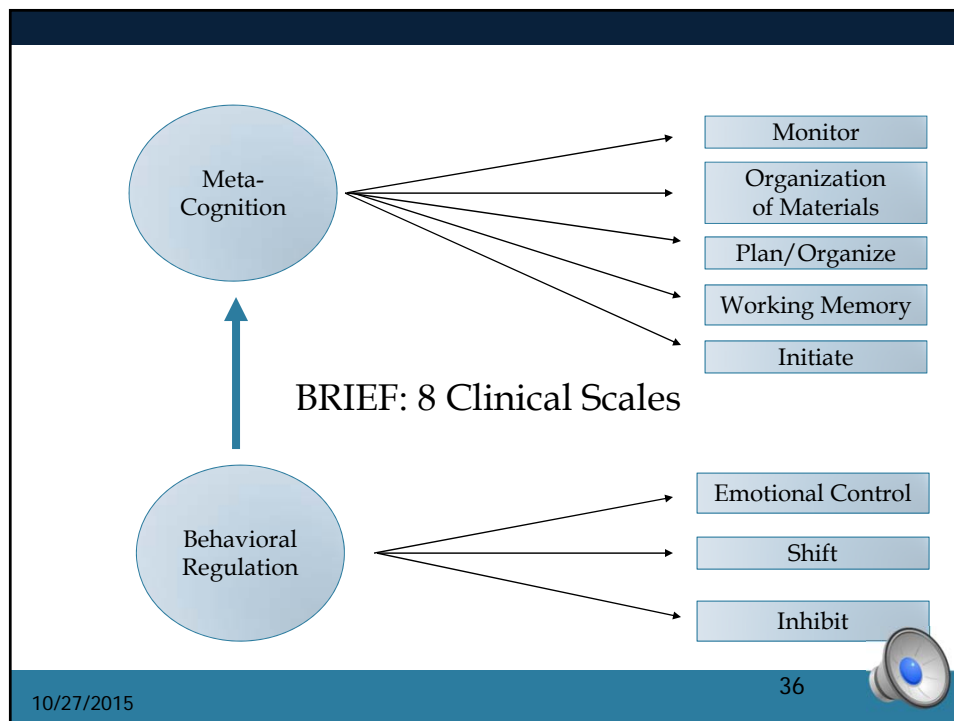
Tri State Webinar Series 2015-2016

## Behavioral Rating Inventory of Executive Function – BRIEF (Gioia, Isquith, Retzlaff, & Espy, 2002)

- 86 items - Multiple Rating Forms: Preschool - Adult (parent, teacher, and self-rating for ages 12+)
- Normed on 1,419 parents and 720 teachers
- .80+ test-retest reliability
- 8 Clinical Scales



Tri State Webinar Series 2015-2016



10/27/2015

36



## Current Assessment of Executive Function

- Involves gathering information from several sources and across time and settings.
- Observation in natural settings (classroom, home)
- Interviews with the student (individual), parents, and teachers
- Checklists/ Assessments



Tri State Webinar Series 2015-2016

## CEFI: Comprehensive Executive Function Inventory



- 5 to 18 years
- Parent, teacher, Self 12-18
- 90 items, 9 Scales
- Attention, Flexibility
- Emotional Regulation
- Inhibitory Control
- Initiation, Organization, Planning, Self-Monitoring
- Working Memory



Tri State Webinar Series 2015-2016

OBSERVATIONAL WORKSHEET					
Informal Assessment of Executive Function Skills					
Date:		Student:		Age:	
Diagnosis:					
Environment:					
Task Observed:					
Response Key:					
Y=Yes; N=No; C=Consistently; S=Sometimes; R=Rarely; H=Here (describe); NH=But Not Here (describe)					
> > Attention < <					
#	Question	Present	Consistent	Context	Prompts Needed
1.	Can the child focus on the required task?	Y N	C S R	H NH	C S R
2.	Can the child sustain attention to task? Record time:	Y N	C S R	H NH	C S R
3.	Can the child selectively attend to relevant stimuli and tune out distractions?	Y N	C S R	H NH	C S R
4.	Is the child able to attend to more than one set of relevant stimuli?	Y N	C S R	H NH	C S R
5.	Can the child shift attention between task components as required?	Y N	C S R	H NH	C S R
> > Inhibition < <					
#	Question	Present	Consistent	Context	Prompts Needed
1.	Can the child control impulsive behaviors?	Y N	C S R	H NH	C S R
2.	Does the child require cues to stop talking in order to listen?	Y N	C S R	H NH	C S R
3.	Does the child stop to evaluate a situation before responding?	Y N	C S R	H NH	C S R
4.	Does the child plan responses before acting?	Y N	C S R	H NH	C S R
5.	Can the child delay desirable behaviors until they are required by the task?	Y N	C S R	H NH	C S R
6.	Can the child inhibit impulsive verbal responses to meet the social criteria of the interaction?	Y N	C S R	H NH	C S R

Tri State Webinar Series 2015-2016

Response Key:					
Y=Yes; N=No; C=Consistently; S=Sometimes; R=Rarely; H=Here (describe); NH=But Not Here (describe)					
> > Attention < <					
#	Question	Present	Consistent	Context	Prompts Needed
1.	Can the child focus on the required task?	Y N	C S R	H NH	C S R
2.	Can the child sustain attention to task? Record time:	Y N	C S R	H NH	C S R
3.	Can the child selectively attend to relevant stimuli and tune out distractions?	Y N	C S R	H NH	C S R
4.	Is the child able to attend to more than one set of relevant stimuli?	Y N	C S R	H NH	C S R
5.	Can the child shift attention between task components as required?	Y N	C S R	H NH	C S R
> > Inhibition < <					
#	Question	Present	Consistent	Context	Prompts Needed
1.	Can the child control impulsive behaviors?	Y N	C S R	H NH	C S R
2.	Does the child require cues to stop talking in order to listen?	Y N	C S R	H NH	C S R
3.	Does the child stop to evaluate a situation before responding?	Y N	C S R	H NH	C S R
4.	Does the child plan responses before acting?	Y N	C S R	H NH	C S R
5.	Can the child delay desirable behaviors until they are required by the task?	Y N	C S R	H NH	C S R
6.	Can the child inhibit impulsive verbal responses to meet the social criteria of the interaction?	Y N	C S R	H NH	C S R

Tri State Webinar Series 2015-2016

## Executive Function Skills

- Focus/ Attention Skills
- Organization
- Planning/Prioritizing
- Working Memory
- Emotional Control
- Problem Solving



Tri State Webinar Series 2015-2016

## More to Come...

- Part Two of this series, “Executive Function: A Closer Look” will go into greater detail discussing the specific components of Executive Function and strategies to support EF skills in individuals with Autism Spectrum Disorders.



Tri State Webinar Series 2015-2016

## Polling Question

- Executive Function stands for an umbrella term comprising a wide range of cognitive processes often called higher order thinking

Just like there is no singular agreed upon definition of Executive Function, to date, there is no singular assessment that can measure the totality of what Executive Function is.

TRUE or FALSE

Tri State Webinar Series 2015-2016

## References

- BRIEF
  - <http://www4.parinc.com/Products/Product.aspx?ProductID=BRIEF>
- Carew, TJ (2000). "Ch. 1". *[Behavioral Neurobiology: the Cellular Organization of Natural Behavior. Sinauer Associates. ISBN 978-0-87893-092-0](#)*
- Chan et al., R.C.K. Chan, D. Shum, T. Touloupoulos, E. Chen. Assessment of Executive Functions: Review of instruments and identification of critical issues. Archives of Clinical Neuropsychology, 23, (2) (2007), pp. 201-216.

Tri State Webinar Series 2015-2016



## References

- Center on the Developing Child – Harvard University
  - [http://developingchild.harvard.edu/index.php/resources/briefs/inbrief\\_series/inbrief\\_executive\\_function/](http://developingchild.harvard.edu/index.php/resources/briefs/inbrief_series/inbrief_executive_function/)
- Colorado Department of Education Brain Injury in Children and Youth: A manual for Educators.
  - [http://www.cde.state.co.us/cdesped/tbi\\_manual\\_braininjury](http://www.cde.state.co.us/cdesped/tbi_manual_braininjury)
- Dawson, P. & Guare, R. *Executive Skills in Children and Adolescents. A Practical Guide to Assessment and Intervention. 2<sup>nd</sup> Edition*
- Goldstein, S. & Naglieri, J. (Eds.) (2014) *Handbook of Executive Functioning*. New York: Springer Press.

Tri State Webinar Series 2015-2016

## References

- Jill Kuzma's SLP Social & Emotional Skill Sharing Site
  - <https://jillkuzma.wordpress.com>
- National Association of School Psychologists, 2010
  - [http://www.nasponline.org/conventions/handouts2010/unstated/nasp\\_ef\\_presentation.pdf](http://www.nasponline.org/conventions/handouts2010/unstated/nasp_ef_presentation.pdf)
- NIH Toolbox
  - <http://www.nihtoolbox.org/WhatAndWhy/Emotion/Pages/default.aspx>
- Sarah Ward: Cognitive Connections Executive Function Practice
  - <https://cognitiveconnectionstherapy.com>

Tri State Webinar Series 2015-2016

# THANK YOU!

Sharon Krupa-Sirotek, Ph.D.  
Licensed Clinical and School Psychologist



Tri State Webinar Series 2015-2016



## WEBINAR STUDY QUESTION FORM

WEBINAR - Introduction to Executive Function (HELD ON October 28, 2015), 45 MIN LONG

Please answer the study question(s) below and submit to Amanda Timmerman ([Timmerman\\_A@cde.state.co.us](mailto:Timmerman_A@cde.state.co.us)) with the following information:

1. Name
2. Email Address
3. School District
4. Role (Teacher, para, SLP, etc.)

### STUDY QUESTION(S):

1. What is the definition of Executive Function?
2. What part of the brain is responsible for higher order thinking or executive function?
3. Give 2 examples of behaviors or characteristics that would be displayed in an individual who may have problems with executive function.