

**Executive Functioning in Individuals with ASD and Related Disabilities**

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**Rochester Regional Center for Autism Spectrum Disorder (RRCASD)**

Provides Community Education and Technical Assistance to increase knowledge of ASD and available regional resources

Strives to enhance community resources through new activities and product development:

- Information & Referral
- Webinar Series
- Newsletters
- Information Sheets on ASD-related topic
- Community Presentations & Events
- Parent/Guardian & Professional Development Programs



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**House Keeping**

To reduce background noise during the webinar, please put yourself on 'mute' through your phone or computer.

Please feel free to type any questions into the 'chat' box on your screen. We will review/answer questions during the Q & A at the end of the webinar.

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### Objectives

1. Identify the general skills necessary for student success
2. Define executive functioning
3. Identify the primary executive functions
4. Describe executive dysfunction
5. Discuss strategies and interventions for executive function skills

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### Skills Associated with School & Life Success

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### What is Executive Function?

- A collection of brain processes that guide thought and behavior located primarily in the prefrontal cortex but involving other neural networks.
- Executive functions are essentially the "conductor" of the brain.
- Higher order cognitive skills that enable independent, purposeful, goal-directed behavior.
- A set of mental processes that helps connect past experience with present action.
- [https://www.youtube.com/watch?v=efCq\\_vHUMqs](https://www.youtube.com/watch?v=efCq_vHUMqs)

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### Executive Functioning

•Associated Skills:

- Setting Goals
- Planning
- Strategizing
- Sequencing
- Prioritizing
- Initiating
- Self-monitoring
- Emotional Control
- Inhibiting
- Paying attention
- Pacing
- Shifting
- Remembering
- Attending to details
- Managing time and space
- Completing tasks
- Working memory

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### Executive Functions (work together in various combinations)

Organizing, prioritizing, and activating to work	Focusing, sustaining and shifting attention to tasks	Regulating alertness, sustaining effort, and processing speed	Managing frustration and modulating emotions	Utilizing working memory and accessing recall	Monitoring and self-regulating action
1. Activation	2. Focus	3. Effort	4. Emotion	5. Memory	6. Action

[IE Brown (2001) Manual for Attention Deficit Disorder Scales for Children and Adolescents]

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### How does executive function affect learning?

**•In school, at home or in the workplace we are required daily to self-regulate behavior:**

- Make plans
- Keep track of time and finish work on time
- Keep track of more than one thing at once
- Evaluate ideas and reflect on our work
- Change our minds and/or mid-course corrections while thinking, reading, & writing
- Connect & Include past knowledge in discussions
- Ask for help or seek more information when we need it
- Engage in group dynamics
- Wait to speak until we are called on

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### Examples of Executive Dysfunction

- Difficulty planning a project & comprehending how much time a project will take to complete
- Difficulty telling a story (verbally or in writing); has trouble communicating details in an organized, sequential manner
- Difficulty with memorization and retrieving information from memory
- Difficulty or inability in initiating activities or tasks, or generating ideas independently
- Difficulty retaining information while doing something with it; e.g., remembering a phone number while dialing

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### Student Examples

- Alice is always late. She loses things or spends much of her time looking for things, and rarely turns in her work.
- Chester’s desk, locker and backpack are a mess. He can never find anything, things are falling out & he shoves papers and books in repeatedly. I gave him color coded folders for each subject. They disappeared. He cannot get started on his work in a timely fashion and is so slow in completing tasks but usually won’t do work in class.
- We just went over the math strategy, we wrote it on the board and practiced it 3 times together in the small group and Bert could not do the next one by himself. In fact, he could not remember any of the steps even when it was on the board.

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### Student Examples Continued

- Ernie never looks at what is written down. I feel like a broken record reminding him & going over the instructions for homework. No matter what I do he takes hours to do his work and then either he has so many mistakes or doesn't get it done.
- Cookie is so bright and creative. She did okay until fourth grade. She hasn't completed or turned in any of her class or homework. She gets stuck on doing things over and over but can't move on. Teachers say she participates in class when she is interested and does pretty well on tests but her grades are failing because of the work.

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### Diagnosis and Assessment

- Neuropsychological and clinical measures of brain function
- No single measure can adequately assess executive function
- Multiple formal and informal measures should be used
- Use of checklists alone can typically overestimate executive impairments
- Consideration of age and functioning related to same age peers
- Should monitor and re-assess

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### Rating Scales

- Behavior Rating Index of Executive Function (BRIEF) [2000, Psychological Assessment Resources] Ages 5-18, parent and teacher versions
- Comprehensive Behavior Rating Scale for Children (CBRSC) ages 6-14
- Child Behavior Checklist (CBCL) [1991, Achenbach] *Teacher report*

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### Formal Measures

- NEPSYII preschool ages 3-4 and ages 5-16 [2007,Korkman, Kirk, Kemp]
- Cognitive Assessment System [1997, Naglieri & Das]
- Children’s Category Test (CCT) ages 6-16 [1993, Boll, T.] and California Verbal Learning Test-children’s version (CVLT-C)
- WISC-IV *Advanced Clinical Interpretation* [Weiss, Sakiokse, Prifitera, Holdnack]

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### Other Formal Measures

- Connors Continuous Performance Test-II [computerized attention task]
- Trailmaking [visual motor task]
- Stroop Color Word Test [inhibition and shifting]
- Delis-Kaplan Executive Function System [sorting test]

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### Other Measures

- Observation (during formal assessment, classroom & during specific subjects such as math, reading and study skills, informal settings and with peers, and home)
- Permanent product (work samples, desk, backpack etc.)
- Interview (teachers, parents, student, others)

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### Conditions Associated with Executive Function Deficits

- Attention Deficit Disorder
- Attention Deficit and Hyperactivity Disorder
- Autism Spectrum Disorder
- Tourette's Syndrome
- Traumatic Brain Injury and other health impairments involving the brain e.g., lesions
- Other Learning Disabilities
- Anxiety
- Sleep Disorders
- Obsessive Compulsive Disorder
- BiPolar Disorder
- Disruptive Disorders (Oppositional Defiant and Conduct Disorder)

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### Core Components of Executive Functions

- Impulse Control
- Attention
- Emotional Control
- Initiation of tasks/activities
- Memory
- Planning
- Organization
- Time Management
- Self-Monitoring

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### Impulse Control

- Upon receiving any information the individual is able to synthesize the information before responding
- Basically the ability to stop, think, plan and then act
- Waiting to respond
- Selecting a response before acting on it
- Foreseeing the outcome of action(s) and "weighing" the outcome(s) before selecting a response and acting (*higher level*)

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### Attention


1. Being able to sustain one's attention is essential for information processing

Task or thought completion requires the ability to maintain a consistent behavioral response (*sustained attention*)

2. The ability to shift one's attention is essential for flexibility

Conscious and deliberate movement of one's concentration from one thing to another and the ability to hold onto information for each item (*shifting attention*)

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### Emotional Control

The ability to control one's emotions and responses to negative environmental events develops in stages:

- Infancy
- Toddler
- School-age
- Adolescents
- Adulthood

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### Initiation

- After receiving information the ability to begin a task/activity in a timely fashion
- Processing input and then being able to produce an outcome (*output*)
- Ability to begin promptly and not succumb to distraction or other environmental factors

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### Memory

- The process used for temporarily storing and arranging information
- Storage and then subsequent retrieval of information
- Complex process involving multiple areas of the brain and channels
- Significant impact if the student has poor working memory and recall

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### Planning

- Breaking down a task and setting goal(s) towards the final outcome or product
- Identifying all the necessary components before beginning (*total amount of time required, timeline towards completion and identification steps to be completed at each increment, materials needed, identifying plausible confounding variables etc.*)
- Identifying the steps that will result in the desired outcome or product

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### Organization

- The ability to develop and a maintain a system for arranging and keeping track of important information and items
- Establishing routines
- Sequencing expectations
- Maintaining order/structure

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### Time Management

- Identification of how much time is required to complete a given task or accomplish something and then developing a plan for how to allow sufficient time to achieve the goal of completing that task
- Planning and allowing for time should there be interfering factors
- Remaining task focused for the duration

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### Self-Monitoring

- The ability to understand what occurs in the environment and how that impacts on the individual, identify how one responds to those situations, learn more adaptive responses to those situations and then apply them during the stressful situation(s)

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### Strategies for Executive Function Skill Development

- General Strategies:
  - Task analysis of the instruction (BREAK it down) & systematic teaching of each component (step-by-step approaches to work)
  - Use visual supports & schedules
  - Use time organizers, computers or watches with alarms
  - Provide written directions with oral instructions whenever possible
  - Plan and structure transition times and shifts in activities

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### Strategies for Executive Function Skill Development

- Consideration of classroom structure (seat assignment, desk position, predictable routine, etc.)
- Promote social engagement & teacher-parent collaboration
- Teach problem-solving skills and assist in identifying appropriate solutions
- Provide feedback and positive reinforcement
- Assign tasks of low-interest with those of high-interest to maintain engagement

(Sohlberg, MM & Mateer, CA. Cognitive Rehabilitation: An integrative neuropsychological approach, 2001)

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### Strategies for Executive Function Skill Development

- Use multiple modalities for instruction, not just didactic instruction (lecture) and paper/pencil tasks e.g., use of technology, fun drills, software, games, hands on activities & materials
- Frequent opportunities for individual and small group instruction versus whole group
- Classroom should minimize visual and auditory distractions especially during instruction
- Build in movement opportunities or allow for position changes during instruction
- Build in active school related activities and jobs

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### Strategies for Executive Function Skill Development

- Gain the individual's attention before delivering direction/instruction
- Stop and summarize key points at planned intervals
- Repetition of information
- CUE the student to important information with tone and visual cues
- Provide anticipatory cues for changes and transitions
- Allow sufficient time in between activities
- Prompt when necessary

(Sohlberg, MM & Mateer, CA. Cognitive Rehabilitation: An integrative neuropsychological approach, 2001)

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**Strategies for Executive Function Skill Development**

- Managing time:
  - Checklists and "to do" lists with estimates of how long tasks will/should take
  - Break long assignments into chunks and assign time frames for completion of each chunk
  - Use visual calendars to keep track of long term assignments, due dates, chores, and activities
  - Use management software
  - Provide & write the due date on top of each assignment

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**Strategies for Executive Function Skill Development**

- Work area and materials:
  - Provide a model for organizing the work space
  - Monitor and minimize clutter
  - Consider having separate work areas with complete sets of supplies for different activities
  - Schedule a weekly (daily) time to clean and organize the work space

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**Strategies for Executive Function Skill Development**

- Managing work:
  - Use of a checklist for each task/assignments. For example, a student's checklist could include such items as: get out pencil and paper; put name on paper; put due date on paper; read directions; etc.
  - Meet with a teacher or teaching assistant on a pre-determined basis to review work; troubleshoot problems
  - With the use of the checklist(s) and meeting(s) with the adult(s) begin to introduce the concept of self-monitoring
  - Do NOT allow assignments to accumulate
  - Have a pre-determined time to catch up on any missing work

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### General Student Factors & Related Strategies

- Alertness
- Sleep
- Diet & consistent meal schedule
- Energy level
- Learning style
- Interest
- Attention span & level of engagement
- Receptiveness to feedback
- Experiences with success

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### Strategies for Executive Function Skill Development

•Additional Strategies for Parents:

- Reinforce positive behavior
- Provide feedback immediately & frequently
- Explain consequences
- Prompt when necessary

(Barkley, RA. Taking Charge of ADHD. 1995: 129-136; Alza Corporation. Concerta Slide Kit. 2000.)

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### Key Components to Developing Efficient Skills

- Early Attention
- Direct Instruction
- Modeling and Extensive Opportunities for Practice
- Explicit Feedback
- Address Student's Motivation and Effort
- Frequent Reassurance
- Use of Supportive and NOT Punitive Approaches

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### Self-Monitoring & Self-Management

- A primary goal of education is to assist individuals to become more independent in managing their own behavior.
- For most people, this is a gradual process which extends well into adulthood!
- For many individuals with learning issues, executive function deficits, autism spectrum disorders etc., moving towards increased independence is difficult without systematic, long term instruction.
- Support persons strive to assist individuals with autism spectrum disorders in reaching greater heights of independence and autonomy, many of our efforts actually result in teaching individuals to be heavily reliant on outside influences and controls.

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### Teaching Self-Management

1. Operationally Define the Target Behavior
2. Identify Functional Reinforcers
3. Design or Choose a Self-Management System/Device
4. Teach the System or Use of Device and check for Understanding
5. Monitor Closely and Provide Feedback or Adjustments
6. Teach Independence (Systematically reduce prompts, increase amount of time student monitors self, increase amount or duration before reinforcement, move individual towards self-reinforcing and when criteria is met

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- Cognitive Flexibility—Use of riddles and jokes to help students shift between word meanings. For math activities teach students to ask themselves "Do I know another way to solve this problem, Does this look similar to other problems I have seen, Is this problem the same or different from the one before it?"
- Prioritizing—Teach students about voice tone and intonation. Initially have teacher's exaggerate their intonation during lessons and have students practice listening and identifying the importance. Students can also be taught to highlight the most important ideas in a text in one color and details in another color.

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•Memorization—When using acronyms to help students memorize information, the “crazier the phrase,” the better. For non-verbal students incorporate a visual.

•Note-taking—To help students prioritize and remember information students can take 3-column notes: the first column contains one word that is the core concept, the second column contains the details supporting the concept, the third column contains the strategy the student will use to remember the information. When taking notes from text, students can use a 2-column approach. In the first column, students ask themselves questions about the text, and they put the answers in the second column.

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•Self-Monitoring and Self-Checking—Helping students check their work requires two processes:

- 1) Provide explicit checklists for assignments, so students know what to check for, and
- 2) Help students develop personalized checklists, so they become aware of and check for their most common errors.

As a final step, students can make their own acronyms to remind themselves of their personal error traps. Feedback is essential and the use of reinforcement systems may be necessary initially.

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### Resources

*Promoting Executive Function in the Classroom*, Lynn Meltzer, Ph.D. (Editor); Guilford Press, April 2010.

*Executive Function in Education: From Theory to Practice*, Lynn Meltzer, Ph.D. (Editor); Guilford Press, Spring 2007.

*No Mind Left Behind: Understanding and Fostering Executive Control--The Eight Essential Brain Skills Every Child Needs to Thrive*. Cox, A., The Penguin Group, 2007. [www.dradamcox.com](http://www.dradamcox.com)

*Executive Skills in Children and Adolescents: A Practical Guide to Assessment and Interpretation*. Dawson, P., Guilford Press, 2004.

*Executive Skills for Children & Adolescents*. Dawson, P. & Guare, R., Guilford Press, 2010.

*Smart But Scattered: The Revolutionary "Executive Skills" Approach to Helping Kids Reach Their Potential*. Dawson, P. & Guare, R., Guilford Press, 2009.

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**Resources**

*Strategies for Organization: Preparing for Homework and the Real World* by Michelle Garcia Winner (DVD of 3.5 hour workshop addressing All students. Best for Grades 4-12)

*Essentials of School Neuropsychological Assessment.* Miller, D., Wiley, 2007.

*A Day in the Life of a Child with Executive Functioning Issues*  
<https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/>

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**Resources**

Rochester Regional Center for Autism Spectrum Disorder (RRCASD)

- Educational resources, webinars, Information & Referral services.
- Contact information:
  - Website: [www.golisano.urmc.edu/rrcasd-nyautism](http://www.golisano.urmc.edu/rrcasd-nyautism)
  - E-mail: [rrcasd@urmc.rochester.edu](mailto:rrcasd@urmc.rochester.edu)
  - Phone: 1-855-508-8485
- Autism Speaks: [www.autismspeaks.org](http://www.autismspeaks.org)
  - This site contains various toolkits and guides for home, school, work, safety, health/medical, etc.

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**Question & Answer**

A Webinar Evaluation Survey and information regarding a Certificate of Attendance for today's webinar will be sent to your email. If you have any questions, please contact the RRCASD at [rrcasd@urmc.rochester.edu](mailto:rrcasd@urmc.rochester.edu).

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**2016-2017 Webinar Series**

Strategies for Addressing the Sleep Challenges of Persons with ASD

**Wednesday, May 17, 3:00-4:30 p.m.**  
David McAdam, Ph.D., BCBA-D

Registration Period: 4/26-5/10

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**Skirboll Family Autism Conference**

Saturday, June 10<sup>th</sup>  
8:30 a.m. - 2:00 p.m.  
The Strong Museum of Play

Register at <https://www.surveymonkey.com/r/skirbollreg>

For more information, please contact the RRCASD at [rrcasd@urmc.rochester.edu](mailto:rrcasd@urmc.rochester.edu) or 1-855-508-8485.

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