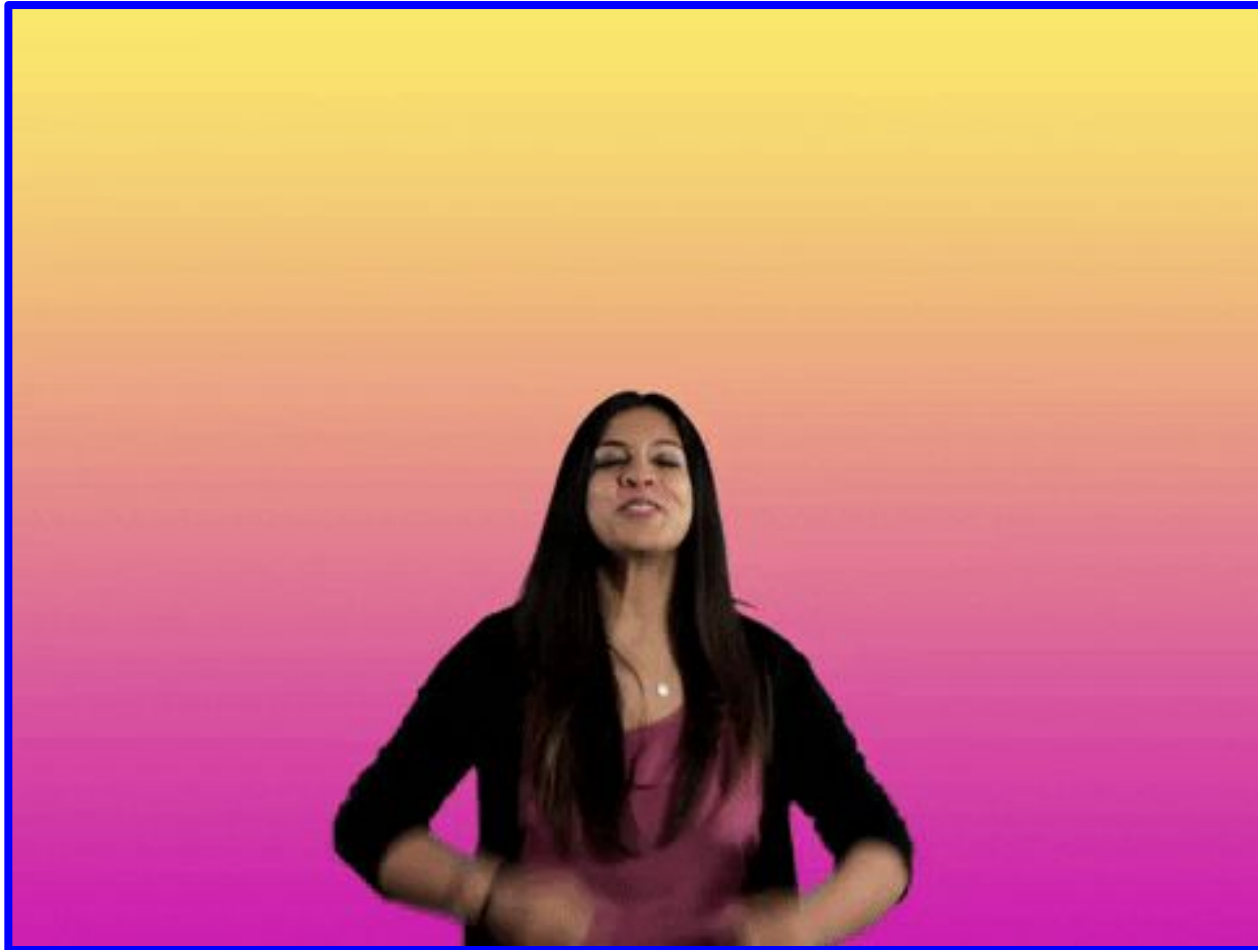




# Executive Functioning Skills and Autism

Dr. Kerry Catanese, Ph.D.

# Introduction



# Learning Objectives

- Define executive functioning and identify related skills
- Learn about executive functioning skill development
- Discover how executive functioning skills relate to everyday living activities and wellbeing
- Discuss strategies to foster executive functioning skills in individuals with autism spectrum disorder

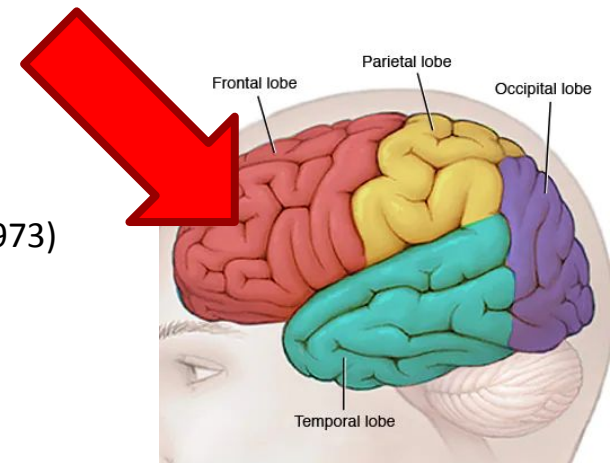
# Executive Functioning (EF) Definition

- The overarching regulation of goal-directed, future-oriented, higher-order cognitive processes

(Baggetta & Alexander, 2016)

- EF helps (Barkley, 2021):
  - Organize thoughts and activities
  - Prioritize tasks
  - Manage time efficiently
  - Make decisions

- EF linked to frontal lobe (Pribram, 1973)



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# EF Definition Continued

- There are various models of EF in research (Demetriou, DeMayo, & Guastella, 2019)
  - Seven core EF (Barkley, 2021):
    - Self-awareness
    - Inhibition
    - Non-verbal working memory
    - Verbal working memory
    - Emotional self-regulation
    - Self-motivation
    - Planning and problem solving

# EF Definition Continued

- EF skill deficits may look like difficulty with:
  - Starting and/or completing tasks
  - Following directions
  - Time management
  - Forgetting information
  - Regulating emotions and/or impulses
  - Keeping track of belongings
  - Planning for future events
  - Stringing actions together to meet goals
  - Analyzing or processing information

# EF and Autism

- Autism spectrum disorder (ASD) affects
  - Social, communication, behavioral skills
    - Learning, thinking, problem-solving skills of individuals with ASD can vary
- ASD has been linked to EF impairment (Demetriou et al., 2018)

# EF and Autism

- Examples of EF strengths and weaknesses for individuals with ASD
  - Sees details clearly ⇒ struggles with big picture
  - Follows schedules/routines ⇒ struggles if they change
  - Understands/follows rules ⇒ struggles to cope when they are broken
  - Difficulty with focus, motivation, impulses, and working memory
  - Difficulty communicating wants/needs
  - Can work with concrete objects/ideas ⇒ struggles with abstract





# EF Development

- We are not born with EF skills (Harvard University, 2014)
  - EF can be developed over time though!
- According to Barkley (2021):
  - Core EF develop over time in chronological order
    - Self-awareness starts at age 2
    - Planning and problem solving develop by age 30
- EF are affected by environmental factors (Calderon, 2020)

# Importance of EF

- EF skills are used in daily activities and situations  
(Pathways, 2020)
  - During play
  - While socializing
  - At school
- EF skills can be practiced and reinforced across settings
  - Generalization can increase skill development

# Importance of EF

- Harvard University Center on the Developing Child, 2021
  - EF play a role in
    - School achievement
    - Positive behaviors
    - Good health
    - Work success

# EF Misconceptions

- Harvard University Center on the Developing Child, 2021
  - EF skill deficits may not necessarily be naturally outgrown
  - Children with EF skill deficits are not “bad kids”



# Improving EF



# Other Important Considerations

- Calderon, 2020
  - EF interventions are not one-size fits all
  - Best approach to EF interventions:
    - Utilize child's strengths and vulnerabilities
    - Consider family needs and functioning
    - Caregiver-child relationship plays a major role



# Promising Interventions for EF

- Calderon, 2020
  - Structured neuropsychological, educational, and socioemotional programs
    - Mindfulness
    - Computerized programs
    - School curricula
    - Physical activity

# General EF Skill Building and Workarounds

- Rudy, 2020
  - Direct instruction
  - Role play
  - Setting up practice challenges
  - Social stories
  - Apps to manage time

# General EF Skill Building and Workarounds

- Rudy, 2020
  - Visual reminders/schedules
  - Breaking projects down into manageable steps
  - Simplify/modify the task or process
  - Rewards/recognition for appropriate display of EF skills

# Strategies for EF Skill Development

The Autism Community in Action, 2021

home

activities that develop executive functioning skills



## planning and organization

- Keep a family calendar in a high traffic area.
  - Teach your child how to follow the calendar and use it themselves.
- Make checklists for daily routines and tasks.
  - Indicate a budgeted time for each item on the list.
- Use a homework planner between school and home.
- Place visual reminders by the door with a checklist of items needed for school, therapy, family outings, etc.
- Work with your child on keeping their rooms neat and orderly.
  - Label where items belong.
- Break large projects/chores into smaller tasks.
- Help your child plan a Family Fun Day
  - Where to go?
  - What hours is it open?
  - What time should we leave?
  - How long will we be there?
  - Do we need to bring or pack anything with us?



## self regulation

- Teach your child self-regulation strategies in natural environments when they are calm.
  - Model calm behavior
  - Use positive reinforcement
  - Offer choices
  - Take deep breaths
  - Go for a walk
  - Get sensory input
  - Ask for help
  - Go to a quiet area
- Acknowledge when your child is struggling, upset, or angry. Label those emotions and patiently help them calm down.
- When your child is calm, talk with them about how it feels to be sad/frustrated/upset/anxious and how to acknowledge those feelings.
- Using visuals, create a plan to use coping strategies and practice it.

# Strategies for EF Skill Development

## The Autism Community in Action, 2021



Many board games work on executive functioning skills while being fun!

- Chess, Distraction, Pictionary, Go Fish, AnimaLogic, Exploding Kittens, 5 Second Rule, Hullabaloo, Concentration, Uno, Blue Plate Scramble, Ticket to Ride, and more!



- Start with simple tasks and work up to complex, multi-step chores
- Provide visual reminders, cues, and/or checklists
- Assist as needed
- Praise your child for their work



- Visualization is an important part of working memory.
  - Use paper, pencil, markers, paint, sidewalk chalk, play-doh, anything creative!
  - Ask your child to do a task but have them draw a picture of it first.
  - Think of a memory or something your child did that day and draw it.
  - Call out different colored shapes and have your child match, point, or draw them.
    - Increase the number of items and difficulty as skills improve.
  - Read a descriptive sentence or short story and have your child describe or draw it.

# Activities to Exercise EF

- Harvard University's Center on the Developing Child, 2021
- In early childhood
  - Lap games
  - Hiding games
  - Imitation or copying games
  - Simple role play
  - Fingerplays

# Activities to Exercise EF

- In early childhood (continued)
  - Active games
    - Imitation games
    - Games that require active inhibition
    - Song games with movement
    - Narrating play
    - Matching or sorting games
    - Movement activities

# Activities to Exercise EF

- In middle childhood
  - Card games and board games
  - Physical activities
  - Movement/song games
  - Strategy/reflection games
  - Musical instruments



# Activities to Exercise EF

- In adolescence
  - Goal setting, planning, and monitoring
  - Physical activities
  - Musical activities
  - Strategy games and logic puzzles
  - Computer games

# Accommodations for EF Skill Development

## The Autism Community in Action, 2021

### school accommodations



#### behavior

- Offer frequent breaks
- Positive behavior support reward system
- Structured movement breaks
- Choice boards
- Fidgets
- Advanced notice of schedule changes
- Assistance with group work
- Preferential seating
- Reminders to stay on task

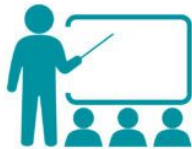


#### assignments and tests

- Modified assignment length
- Extra time to complete assignments and tests
- Checklists for multi-step tasks/assignments
- Break large projects down into smaller chunks with due dates
- Assistive technology
  - Speech-to-text, AAC, ModMath, etc.
- Oral administration of tests
- Alternative test answers
  - Word bank, multiple-choice, circle answer, etc.
- Opportunity to work on assignments and take tests in small group settings

# Accommodations for EF Skill Development

## The Autism Community in Action, 2021



### instructional time

- Multi-sensory teaching strategies
- Step-by-step directions/instructions
- Frequent checks for understanding
- Opportunity for repeat instruction
- Record class lecture
- Copy of class notes
  - Highlight keywords and ideas



### organization and time management

- Color-code materials and assignments
- Assignment calendar or notebook
- Extra time to organize desk, backpack, locker, etc.
- Daily binder checks
- Graphic organizers
- Visual/written schedule
- Use alarms
  - Computer, phone, or watch

# High School & College

- Arky, 2021
  - Unexpected challenges in high school and college
    - Organization
    - Time management
    - Staying on track
    - Managing schedules
    - Taking care of daily needs
    - Living independently
  - Transition planning is crucial

# Resources

- Autism Society Transitions and Post-Secondary website:
  - <https://www.autism-society.org/living-with-autism/academic-success/transitions/>
- Harvard University Center on the Developing Child's EF Activity Guide
  - <https://developingchild.harvard.edu/resources/activities-guide-enhancing-and-practicing-executive-function-skills-with-children-from-infancy-to-adolescence/>

# Resources

- Nationwide Children's Hospital Family ECHO virtual learning series
  - <https://www.nationwidechildrens.org/for-medical-professionals/education-and-training/echo/series/family>
- Sesame Street in Communities
  - <https://sesamestreetincommunities.org/topics/autism/>
- TED Talk
  - <https://youtu.be/qAC-5hTK-4c>

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# Questions?



