

# Executive Function 101

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# Objectives

- Define executive function.
- How does executive function affect children of different ages as they move through the day.
- Identify your child's strengths and weakness in executive functioning.
- Learn strategies to help your child to develop and refine executive function skills to become more independent, confident and successful.

# What is Executive Function?

- Executive skills are the brain-based skills that are necessary for human beings to perform tasks (design and execute a plan).
- Includes skills necessary to complete simple tasks and more complex tasks.
- The 11 sub skills can be divided into 2 main categories: behavioral and cognition.
- We all have different strengths and weaknesses across these skills.

# Executive Function

## Behavior (action skills)

- Response inhibition
- Emotional control
- Sustained attention
- Task initiation
- Goal directed persistence
- Flexibility

# Executive Function

## Cognition (thinking skills)

- Helps us to select and achieve goals or problem solve solutions.
  - Working memory
  - Planning/prioritization
  - Organization
  - Time management
  - Metacognition

# Development of Executive skills

## **Response inhibition**

- The ability to resist the urge to immediately say or do something or ‘Think before you act’
- Develops in the first 6-12 months
- It is a fundamental executive skill that enables other skills to develop
- Without it you can not initiate, sustain attention, plan, organize or problem solve effectively.

# Building Response Inhibition

- Delay gratification by using waiting periods
  - Set a timer
  - Use First/then
- Earning things (sticker chart or saving allowance)
- Understanding of consequences (share or put away)
- Review situations in advance (long line at water park)
- Practice during role play
- Be present to help with cues for success
- Provide verbal reinforcement when you see the desired behavior
- Offer input opportunities before the task to help them to be calm-squeezes, jumping, swinging

# Development of Executive skills

## **Working memory**

- The ability to hold information in memory while doing a task
- Starts early in infancy with object permanence.
- The skill emerges before language does.
- Nonverbal working memory develops before verbal working memory.
- Remember motor tasks before higher level cognitive

# Building Working Memory

- Make eye contact when giving directions
- Decrease external distractions (turn off TV or game)
- Have the child repeat back directions
- Written reminders (checklists or schedules or texts)
- Rehearse expectations just before the situation
- Problem solve together ways to remember important information
- Rewards and consequences

# Development of Executive skills

## **Emotional control**

- The ability to manage emotions to complete tasks, achieve goals, or control and direct behavior.
- Starts in infancy with the ability to self soothe.
- Progresses to managing temper, anxiety, frustration and disappointment.
- Also means being able to tap into positive emotions to help overcome obstacles.
- Most people have a ‘public self’ and a ‘private self’

# Improving Emotional Control

- Regulate the environment with the younger child
- Discuss expectations and what to do if overwhelmed
- Coping strategies (signal when you need a break, self soothing, deep breath, music, etc)
- Simple self statement to talk self through a challenge
- Read stories about characters who exhibit the behavior that you want you child to learn (Librarians can help)
- Provide calming sensory input **before** challenges
- Allow for sensory breaks **during** challenges

# Development of Executive skills

## **Sustained attention**

- Ability to keep attending to task despite distractions, loss of interest or fatigue
- For young children physical, sensory based or hands-on activities will hold their attention longer.
- It is directly related to interest in the activity in the younger child.

# Strengthening Sustained Attention

- Be present in the beginning. Do your work by them.
- Gradually increase expectations
- Use timer of some sort
- Look at the environment
- Self monitoring (when tone sounds-was I paying attention?)
- Make the task more interesting (challenge, game , contest, characters of interest)
- Alternate preferred and non-preferred tasks
- Verbalize acknowledgement of staying on task

# Development of Executive skills

## **Task initiation**

- Ability to begin required and often least favorite tasks in a timely manner.
- Often children put off the least favorite task until last and then they may be more tired and less attentive.
- Routines for daily tasks is often the first way that children learn to get things done (ie morning or bedtime).

# Teaching Task Initiation

- Reinforce/prompt task initiation throughout the day
- Incentive for starting within 3 min
- Visual cue to remind the child to start (picture schedule, note on table, text)
- Break tasks into smaller pieces
- Have the child make a plan for how the task will get done (taking more ownership for the task)
- Have the child decide how she wants to be cued to begin (timer, specific time in the schedule, etc)

# Development of Executive skills

## **Planning/prioritizing**

- Ability to create a plan to complete a task or reach a goal.
- Ability to make decisions about what is important to focus on.
- With young children, the skill is not yet developed but they observe us using a checklist for getting daily tasks or big projects done.
- Both planning and prioritizing develop and are important for the school aged child, especially when they start to receive projects to do.

# Promoting Planning/Prioritizing

- Create plans when your child is young
  - Make a list
  - Check things off as you complete them
- Involve your child in the planning process for preferred tasks
  - “What do we need to do first?”
  - “Then what?”
- Use activities that they want to do as a starting point and/or as the end reward
- Prompt prioritizing by asking “What is the most important thing we need to get done?”

# Development of Executive skills

## Organization

- Ability to create and maintain a system to arrange and keep track of information and items.
- We initially provide our children with organizational systems (book case, toy box, laundry basket, etc)
- We can expect more independence with this as they move into early school age

# Fostering Organization

- Establish a system for things.
- Involve your child as much as possible.
- If there is a lot to be organized, break it into small tasks.
- Once an area is organized, set up a routine for checking it with them (ie: toys picked up or books in back pack before TV time or bed).
- Take a picture of the space once organized so that your child can use that as a model.
- Checklist to make sure that he/she has everything.
- Rewards/consequences for certain things not put away.

# Development of Executive skills

## **Time management**

- The ability to estimate amount of time needed for task and stay within time limits
- This emerges in preschool and early elementary school
- Setting a timer or talking about how long it takes to do things is a great way for children to understand the time management

# Instilling time management

- Try to maintain a daily routine (sing song to wash hands, egg timer for brushing teeth)
- Talk about how long it takes to do things
  - Plan a weekend activity (vacation or a play date with friend
    - What do you want to do?
    - How long will each activity take?
- Use calendars and schedules and include your child
- Use a timer to know how much time is left for the task
- Estimating time

# Development of Executive skills

## **Flexibility**

- The ability to adapt to change.
- The ability to revise plans in response to obstacles, changes, new information or mistakes.
- Babies are not flexible, we revolve around them.
- But as they grow we start to introduce more order related to schedules of the outside world and they begin to adapt.
- Further flexibility develops with new sitters and teachers.

# Encouraging Flexibility

- Environmental modification
- Building structure for the inflexible child first before expanding flexibility
  - Reducing novelty of the situation-limit change
  - Keep to schedules and routine when possible
  - Provide advance warning for what is to come next
  - Give a self statement for handling a situation
  - Reduce the complexity of the task
  - Allow for choices within situations/tasks

# Encouraging Flexibility

- Expanding Flexibility
  - ‘Walk’ with your child through a stressful situation, offer max support initially and then fade
  - Use of social stories
  - Coping strategies – becoming more aware of self and having a way to defuse
  - Introduce mild changes in familiar settings first and then expand to more challenging scenarios (games, doing and obstacle course backward)

# Development of Executive skills

## **Goal directed persistence**

- Set a goal and follow through to completion without getting sidetracked.
- This emerges in preschool and early elementary years
- It is one of the last executive function skills to master but it is a skill that is worked on since very young.
- Any time you helped your toddler to a puzzle, or your Kindergartener ride a bike or shoot a basket.

# Building Goal Directed Persistence

- Start at an early age with brief tasks with the goal within view.
- Begin with tasks that your child wants to work on and then help him or her to stretch for slightly more distant or time consuming ones.
- Give an extra incentive when it is not a preferred goal (chores, homework)
- Remind the child what they are working for but don't nag
- Use technology to provide reminders

# Development of Executive skills

## **Metacognition**

- The ability to stand back and view yourself in the situation (self monitoring and self evaluation)
- How am I doing?
- What could I do differently?
- Complex set of skills that begins in the first 12 months (sorting, classifying, recognizing cause-effect)
- It continues to expand as children begin to become aware of others views and emotions.

# Nurturing Metacognition

- Task performance
  - Praise specific elements of a task (I like the way you...)
  - Teach your child to evaluate their own performance on a task (How do you think that you did?)
  - Help your child identify what finished looks like
  - Teach them self questions to task when confronted with a problem: What is my plan? Am I following my plan?
- Social
  - Play games to read facial expressions
  - Discuss tone of voice and meaning
  - Detective: spots clues about how a person is feeling
  - Identify how their actions might make someone feel

# Progression of practice

- 1:1 Child to adult (home, therapy, school)
- 1:1 Child to child with adult facilitating (play date, OT)
- 1:4-5 with adult facilitating (larger play date or small party, small classroom, OT group)
- 1:20 with 1-2 teachers (classroom)

# Informal development of Executive Function

- Explain rather than dictate (if you leave you bike out ..)
- Let you child know that you understand how they feel and why (You are disappointed because...)
- Encourage self appraisal (what can you do to...)
- Board games are great!
- Be available to model behavior and encourage
- Give them choices
- Gauge their interest, attention and endurance

# Important considerations to support success

- Your child's level of emotional well being
- Look at sensory responses to certain tasks
- Consider the possibility that the child can not complete the task by himself
- Figure out what executive function skills are necessary and does your child have these skills
- Look at the environment
- Has your child been able to do the task sometimes, what made that successful
- Does your child lack confidence for the task

# Set a foundation for success

- Consider your child's developmental level (not just age)
- Teach your child the skills they are deficient in rather than expecting them to acquire them
- Modify tasks to match your child's capacity to work.
- Provide just enough support to be successful
- Just right challenge

# Set a foundation for success

- Use support rather than fighting your child for control
  - Follow schedules and routines
  - Build in choices
  - Practice tasks in small steps
  - Use negotiation

# Set a foundation for success

- Use incentives to augment teaching
  - Verbal or material
- Keep supports and supervision in place until the child masters skills and is successful
- Gradually fade out supports, supervision and incentives
- Start external and move inside
  - Change the environment
  - Adapt the task
  - Adjust how you interact with your child

# Changes to the Environment

- Reduce distractions (quiet time/space for tasks)
- Provide organizational structures (bins, cubbies, assignment notebook, scheduling app)
- Reduce the social complexity of the activity or event (limit number of people and duration at party or play date)
- Change the social mix (focus on time with peers that are a good fit, at parties have a 'get out' option)

# Modify the Task

- Shorten the task (take turns with steps)
- Build in frequent breaks with longer tasks
- Give the child something to look forward to when the task is done
- Give details (checklist or picture of task when complete)
- Create a schedule (list or pictures)
- Make the task more fun

# Adjust the Interaction

- Planning ahead
  - Rehearse what will happen and how to handle it
  - Use verbal prompts and reminders
    - Remember what we talked about
  - Use other cues
    - Visual cues
    - Written reminders
    - Lists
    - Technology (Time timers, Watch Minders)

# Adjust the Interaction

- During the activity
  - Coaching for the rehearsed behavior
  - Check your list or schedule
  - Be available to monitor the situation to better understand triggers and other factors that affect your child's success

# Adjust the Interaction

- After the activity
  - Praise for using good skills
    - Great job starting your homework after 1 reminder
    - Thank you for showing self control when your sister teased you
  - Discuss how it went
    - What happened
    - What worked or didn't
    - What could be done differently next time
  - Consult with others (discuss with spouse, friend, parent)



Our goal as parents, teachers,  
and therapists is to enhance the  
development of effective  
executive function skills in our  
children.

# Resources

- Smart but Scattered by Dawson and Guare
- The Incredible 5 point scale by Buron and Curtis
- Are you in the Zone? By Kowalski
- The Out of Sync Child by Carol Kranowitz
- The Out of Sync Child has Fun by Kranowitz
- Zones of regulation by Kuypers
- How does your engine run? By Shellenberger

# Daily Routines-checklist samples

- Getting ready in am or bedtime routine
- Get ready for school
- Bedroom cleaning
- Putting belongings or laundry away
- Completing chores
- Maintaining a practice schedule
- Desk cleaning

# Daily Routines-checklist samples

- Homework
- Managing open ended tasks
- Long term projects
- Writing a paper
- Studying for tests
- Learning to manage tasks that take lots of effort
- Organizing notebooks/homework

# Daily Routines-checklist samples

- Learning to control temper- what makes me mad
- Learning to control impulsive behavior-what are things I do without thinking
- Learning to manage anxiety-worry board
- Learning to handle changes in plans
- Learning to solve problems-what is my problem