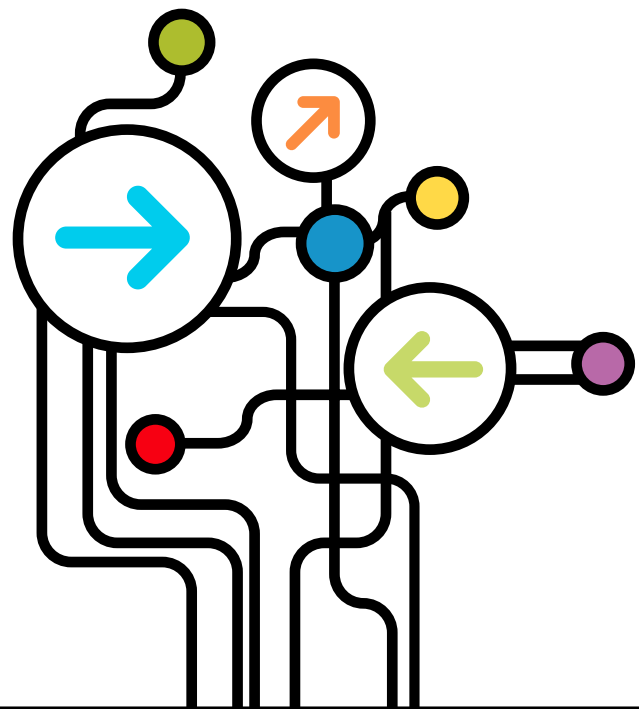


EXECUTIVE FUNCTION 101

Prepared by The National Center for Learning Disabilities

TABLE OF CONTENTS

- Section I p.3
 - Introduction
- Section II p.10
 - Executive Function and Learning
- SECTION III p.21
 - Executive Function, Behavior and Emotions
- SECTION IV p.25
 - Executive Function in Social Situations and Relationships



WHY THIS e-BOOK?

Each of us navigates daily life – learning, work, recreation and relationships – thanks to intrinsic skills called executive functions.

Children and adults with learning and attention issues—including learning disabilities (LD) and Attention-Deficit/Hyperactivity Disorder (ADHD)—often struggle profoundly with many of these skills that most of us take for granted. To better understand and support your kids when they lack certain executive skills, it helps to know about the underlying brain functions that go awry to create such challenges.

This e-book is designed to explain executive functions in a clear, understandable way and to help you pinpoint the struggles your child might experience. It's organized into three broad categories where executive skills come into play: learning; behavior and emotions; and social situations and relationships. Each section includes tips for providing support and practice in specific skill areas. Even if your children don't struggle with executive function, you may come to appreciate their executive skills and learn how to help them shore up those that need work!

SECTION I

WHAT IS EXECUTIVE FUNCTION?

Executive function is a set of mental processes that helps us connect past experience with present action.

People use it to perform activities such as planning, organizing, strategizing, paying attention to and remembering details and managing time and space.

These are skills and processes each of us use every day to:

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

Executive Dysfunction: Signs, Symptoms and Strategies

Problems with executive function (sometimes called “executive dysfunction”) can run in families. Problems can be seen at any age but tend to become more apparent as children move through the early elementary grades. This is when the

demands of completing schoolwork independently can trigger signs of a problem with executive function.

There are no simple tests that identify all of the different features of executive function.

Educators, psychologists, speech-language pathologists and others use a variety of tests to identify problems. Careful observation and trial teaching are invaluable in identifying and better understanding weaknesses in this area.

Your kids may have problems with executive function if they have trouble:

- Planning projects
- Comprehending how much time a project will take to complete
- Telling stories (verbally or in writing), struggling to communicate details in an organized, sequential manner
- Memorizing and retrieving information from memory
- Initiating activities or tasks, or generating ideas independently
- Retaining information while doing something with it, for example, remembering a phone number while dialing

As you'll see throughout this e-book, there are specific strategies you can use to help children with executive dysfunction overcome or compensate for their difficulties.

Does Your Child Have Executive Function Difficulties?

Executive skills develop gradually and at different rates for different people. Most children struggle at one time or another with planning,

organization and follow-through. Learning and attention issues, though, complicate this development. Children with LD or ADHD nearly always have difficulty with one or more executive skills, which can lead to obstacles in learning and behavior.

This checklist will help you recognize executive function difficulties in your child.

This list does not diagnose or pinpoint a specific problem, but it can be helpful as a way to capture your observations and concerns and start a conversation with your child's school personnel or other professionals.



On the next page, we'll look at the overarching executive function categories under which these behaviors fall. This may help you better organize your observations.

IN THE PAST SIX MONTHS,

MY CHILD...

- Has difficulty paying attention
- Is easily distracted
- Requires many reminders to stay on task
- Finds it difficult to set goals
- Seems to struggle with making decisions
- Has trouble identifying where to start on assignments
- Focuses on either details or the big picture at the expense of the other
- Has difficulty getting started on tasks, often seems to procrastinate
- Struggles to comprehend how much time a project will take to complete
- Takes longer than peers to complete homework and other tasks
- Needs numerous prompts from adults to stay on task
- Loses track of time or assignment due dates
- Forgets to turn in completed work
- Struggles with keeping track of needed materials; often leaves materials at home or school
- Finds checking his/her work very difficult (and may not do it at all)
- Has trouble following multiple-step directions
- Forgets what he/she is saying or doing in the middle of a task
- Forgets the details of a text while reading or soon after finishing
- Gets frustrated with changes in schedule or usual routines
- Has difficulty shifting from one activity to another (especially when the rules/task demands change)
- Struggles with shifting between information that is literal vs. figurative, past vs. present, etc.
- Gets stuck on parts of tasks and can't move forward
- Seems to have difficulty controlling impulses—will say or do things without thinking about them first
- Is easily frustrated
- Often talks out of turn and/or interrupts others' conversations

EXECUTIVE FUNCTION BEHAVIORAL CATEGORIES



Impulse Control

the ability to stop and think before acting

For many children with ADHD, lack of impulse control is a fundamental weakness. They often say or do things without using a cushion of time to reflect. They'll do whatever pleasurable thing comes along without considering their obligations or commitments. Children with this weakness often speed through schoolwork, sacrificing accuracy and completeness along the way.

Flexibility

the ability to change strategies or revise plans when conditions change

Children who behave in ways that are inflexible have trouble when a familiar routine is disrupted or a task becomes complicated. They get frustrated when a first attempt to solve a problem isn't successful. They are unable to see new ways to do familiar tasks or to make another choice when the first choice proves unworkable.

Emotional Control

the ability to manage feelings by thinking about goals

Children who can't manage their emotions have trouble accepting even constructive criticism. They can't keep their eyes on their goal when upsetting or unexpected things happen. They're quick to call a situation "unfair." They overreact to losing a game or being called on in class. They have difficulty sticking with schoolwork when they're distressed about something.

Working Memory

the ability to hold information in mind and use it to complete a task

Children with weak working memory are unable to remember and apply crucial information in order to move to the next step of a task. They falter when a task requires that they remember a series of directions, generate ideas in response to the directions and then express their ideas. Information just doesn't "stick" for them.

Planning/Prioritizing

the ability to create steps to reach a goal and to make decisions about what to focus on

Children who have difficulty planning and setting priorities are easily overwhelmed by complicated, multi-part tasks. They can't independently impose structure and order on ideas. They have trouble thinking through the steps required to achieve a goal. They tend to underestimate a project's complexity and time requirements.

Self-Monitoring

the ability to monitor and evaluate your own performance

Children who are weak at monitoring themselves may not notice that they're not following directions until someone points this out. They tend to misjudge their own efforts and have trouble adjusting what they're doing based on feedback or cues. They are often completely surprised by a low grade on a test or project.

Task Initiation

the ability to recognize when it is time to get started on something and begin without procrastinating

Children who are weak in this skill have trouble starting homework and put off projects until the last minute. They're sometimes seen as lazy or unmotivated; keep in mind that kids like this may procrastinate because they really don't know how to start. Many children who have difficulty getting started also have trouble with planning and organizing. They can get so overwhelmed by everything they have to do that they end up doing nothing at all.

Organization

the ability to create and maintain systems to keep track of information or materials

This skill is closely tied to planning, setting priorities and task initiation. Children who lack organizational skills lose permission slips, assignment sheets, notebooks and library books. They may face consequences for being disorganized (for example, if they lose their homework, they get a failing grade) but don't improve their organizational skills in response to these consequences. Children with poor skills in this area may understand the value of organization but are unable to learn how to keep track of things.

Some kids will, through maturation, good teaching and trial and error, independently figure out ways to overcome or compensate for their executive skills weaknesses. Most children with LD and ADHD, though, need extra support to develop or compensate for such deficits. The good news is that you can help your children recognize, improve and work around their areas of executive dysfunction.

As schoolwork gets harder and students are asked to be more independent learners, children with weak executive skills fall further and further behind. Feeling anxious about what to do and how well they're doing (especially when they're "winging it" without a strategy or plan of attack) can easily lead to feeling overloaded and overwhelmed. This in turn leads to exhaustion, inattentiveness and a cycle of insecurity and feeling out of control. Not a great scenario for learning or self-esteem!

Parents, in partnership with schools, can be enormously helpful in the improvement of children's executive skills. Because each child is on a slightly different developmental path and has a unique executive function profile, you'll need to work with your child's teacher to personalize strategies that will best address your child's needs. Directly teaching your child these skills, offering frequent reassurance and giving clear, specific feedback are all essential.

Up next, enjoy our "Executive Function Around the Clock" illustration, which will take you through the challenging day of Josh, a sixth grader who struggles with executive function.



EXECUTIVE FUNCTION AROUND THE CLOCK



Meet Josh, a sixth grader who struggles with executive function.
This is a day in his life.



7 A.M.

Argh! Josh knows that he has forgotten something. Ah, that's it—his cleats for today's game. He sprints back inside the house to get them ... and leaves his backpack in the kitchen. He walks right past the checklist his mom made to help him remember what he needs for school. But it's too late: The bus is here and about to pull away! He's going to miss it again.



EF Area: ORGANIZATION

11 A.M.

Josh's English teacher stands at the blackboard and asks: "Tell me how last night's reading relates to the words on the board." Every hand in the class goes up...except for Josh's. His heart sinks thinking about all the steps answering this question takes.



I don't know...
I wasn't thinking about those words when I read last night.
I'm so overwhelmed.



EF Area: WORKING MEMORY

Last night I was playing my video games and it was AMAZING!!! There were like eighty-five CRAZY MONSTERS and I GOT ALL OF THEM, POW-POW-POW-POW-POW-POW!!!



1 P.M. It's the best part of the school day...lunch! At a table with his friends, Josh shouts at a mile a minute and jumps in and out of his seat. He doesn't even notice that the lunch monitor is glaring at him and that his friends look annoyed.

Sooooo weird.

He never lets anyone else talk!

EF Area: SELF-MONITORING, IMPULSE CONTROL

3 P.M. Time for soccer! A teammate kicks the ball toward Josh. He knows that in soccer, you do one thing—you kick that ball as hard as you can! But where? He can't exactly remember, so he just kicks. *Wham! Uh-oh.* He's sent the ball right into his own team's net. Anger brews on his teammates' faces as Josh's heart sinks yet again.



EF Area: FLEXIBILITY, WORKING MEMORY

Moooo-ooooom.
Josh didn't put the cups on the table AGAIN!

6 P.M. It is time for dinner — but first, Josh has to set the table. *Hmm.* Josh scratches his head and tries to remember exactly what goes at each place setting. He thinks he has got it right this time, but his little sister reminds him that he doesn't. *How dare she!* He blows up screaming at her.

EF Area: ORGANIZATION, EMOTIONAL CONTROL

8 P.M.

After hours of cajoling from his mom, Josh finally sits down to do his homework. But, ugh, where to begin? He knows he has several projects and papers that need attention, but what's due when? What needs done for tomorrow? Overwhelmed, he puts his head down.



I don't even know where to **start**.



EF Area: TASK INITIATION



12 A.M.

Delays and procrastination mean that Josh is burning the midnight oil. He is exhausted, but his history paper is due tomorrow. But he just can't figure out a structure for his paper and the steps he needs to take to get it done.

EF Area: PLANNING & SETTING PRIORITIES

3 A.M.

Finally, the paper is done and Josh can catch a few hours of Z's. But he can't seem to drift off to sleep—he's worried that he didn't do the paper right. And then there's the problem he'll discover tomorrow morning: His disorganization has gotten the best of him, and he forgot to put the finished paper in his backpack.



EF Area: SELF MONITORING, ORGANIZATION

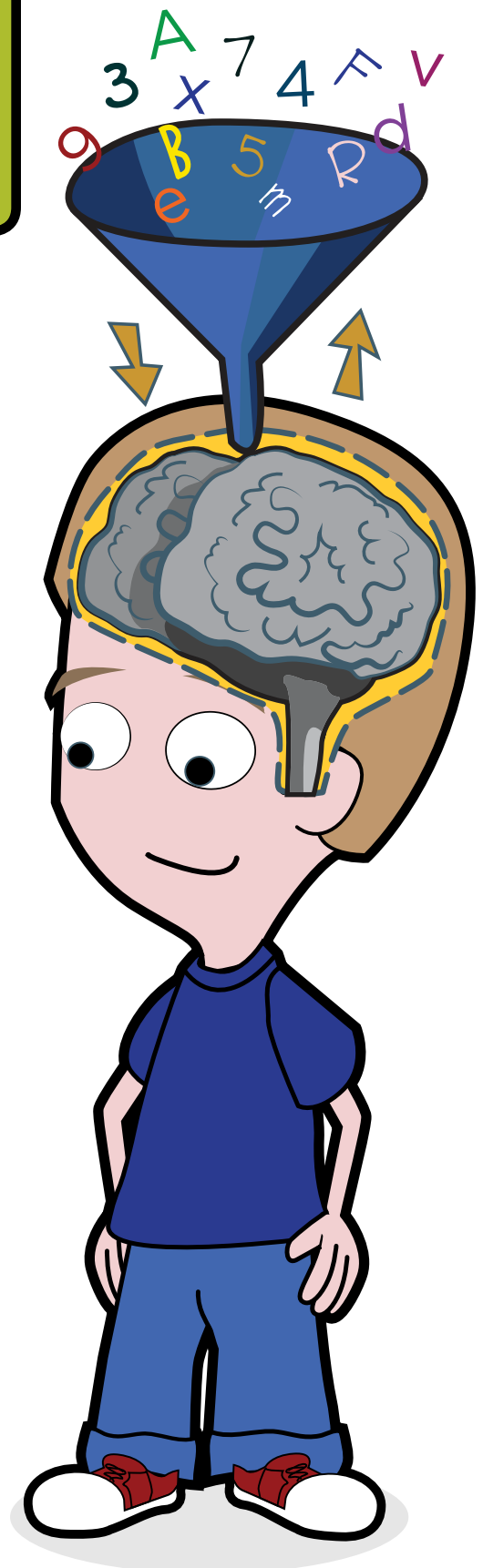
SECTION II EXECUTIVE FUNCTION & LEARNING

The Five Areas of Executive Functioning

Academic success in our 21st-century schools is increasingly linked with children's mastery of a wide range of skills that rely on their use of executive function strategies. The crucial role of executive function processes begins in the preschool years and increases as students progress through middle and high school when they're expected to master complex skills that involve summarizing, note-taking and writing. Each of the five areas of executive function will be explored in more detail in the chapters that follow.

Success depends on students' ability to plan, organize and prioritize tasks, materials and information, separate main ideas from details, think flexibly, memorize content and monitor their progress. It's important to help children understand how they think and learn and to teach them to use strategies in five major executive function areas:

- ➔ Organizing
- ➔ Prioritizing
- ➔ Shifting/Thinking Flexibly
- ➔ Accessing Working Memory
- ➔ Self-Monitoring/
Self-Checking



This infographic was adapted from a
'Clogged Funnel' infographic created by ResearchILD.

ORGANIZING & PRIORITIZING

Organizing and Prioritizing are important executive functions that all of us use at work and in school.

Organization involves arranging possessions, information or tasks into a structured whole so that the parts are coordinated efficiently. As adults, we use a variety of organizational strategies and tools (e.g., calendars, file cabinets and computers) to schedule and manage tasks and keep track of important information. These techniques help us accomplish tasks. As we organize, we also need to prioritize based on our goals and the level of importance of the tasks. For example, we need to select which tasks to tackle first. Let's look at how children call upon those same skills in school.

Why Is Organization Important for Academic Performance?

From the early elementary grades to middle school and beyond, the increasing demands of the curriculum and independent learning call for stronger organizational strategies.

The key areas in which students face organizational challenges are:

- **Homework:** This requires students to write down all assignments correctly, bring home materials needed for their work, complete tasks on time and remember to turn in their work.

- **Long-term projects:** Students need to keep track of many details and manage multiple elements of their projects simultaneously.
- **Studying:** Students need to organize class notes, homework and other materials to prepare for tests and quizzes.

- **Writing:** Students are required to produce cohesive, integrated, analytical compositions that are well organized and prioritize important details.

Why Is Prioritizing Important for Academic Performance?

Students who understand where to focus their efforts on a given day or for a given task are able to complete complex tasks with ease. Students need to prioritize when they do the following tasks.

- **Juggle** long-term and short-term tasks day to day
- **Select** the most important information for note-taking, studying or writing
- **Manage** the competing demands of school, homework and extracurricular activities without losing track of important deadlines

What About Children With LD and ADHD?

Of all the executive skills, organization and prioritization loom especially large, particularly for children with LD and ADHD. Disorganized children with LD or ADHD are often called lazy, unmotivated—even defiant. You may be one of the few people in your child's life who understands how having a disability complicates his or her ability to develop these skills.

How Can Parents Help Children Organize and Prioritize Effectively?

Your child may understand the value of being organized but may not have the slightest idea how to get that way. That's where you can provide invaluable assistance and encouragement. The following strategies can help children succeed with academic and leisure activities and provide a strong foundation for future performance as adults.

Organizing Time

- Use a family calendar to record important commitments. Weekly family meetings can help you coordinate everyone's schedules so that you model good planning and organizational strategies.
- Help your child select calendars (paper or electronic) that can be updated with commitments and tasks whenever you update the family calendar. Encourage your child to review these calendars daily to anticipate new events.
- Encourage your child to schedule fun activities (such as time with friends) along with important obligations.

TECH-SAVVY ORGANIZATION TIPS

Technology-savvy middle and high schoolers can try:

- File-sharing software like Dropbox to keep notes handy anywhere there's an internet connection
- Smartphone apps that serve as digital sticky notes or bulletin boards
- Digital flashcards, also available as apps on smartphones
- Password manager software to keep track of passwords

Organizing Tasks

- Teach your child to think of a long-term project as a "mental movie" by breaking complex tasks into manageable chunks (like movie scenes). Use a white board or sheet of paper to map tasks into flowcharts.
- Encourage your child to write down important tasks in a calendar and to allocate time accordingly. You can teach your child to estimate the time each task will take and to track the time while working. Help kids make lists of homework assignments or chores. Let them experience the satisfaction of checking off tasks as they're completed.

Organizing Materials

- An organized workspace helps children find the materials they need for homework easily and independently. Storing materials in different sections is helpful. For example, all writing tools should be located together.
- Keep reference materials, including calculators, dictionaries and atlases, near your child's homework workspace.
- Help kids identify a regular time during the week for clearing out and organizing their backpack. Work together to make this a pleasant experience so that it becomes a habit!
- Encourage them to use a brightly colored folder to bring important papers (like homework and permission slips) to and from school, so those items don't get lost.

Prioritizing Tasks

- Help kids prioritize homework tasks based on due dates, difficulty level or the level of stress they have about the tasks.
- Encourage them to list the steps needed to complete long-term projects.
- Help them sequence tasks logically. For instance, before looking up vocabulary words in the dictionary, they could alphabetize the list first.

Prioritizing Materials

- Teach kids to review homework and gather materials before starting work so that everything is collected before they start working.
- Store the most commonly used items within easy reach in accessible locations.

Keep It Simple, Relevant and Real

Here are some general attitudes and approaches to keep in mind as you teach your child how to organize and prioritize schoolwork and life in general:

- **Call upon your intimate knowledge of your kids**—their personality, strengths and challenges. Consider how your child thinks and works.
- **Focus first on short-term strategies** related to certain tasks or assignments.
- **Start small.** Help your child see that the smallest improvements will make life easier.
- **Keep it simple.** Help your child be flexible, since children's preferences change as do teachers' requirements. Look for quick, easy ways to begin organizing: a simple planner that you and your child check daily, a routine for filling and emptying a backpack, a schedule for daily homework, study and review.

- **Partner with your child and the teacher.** Collaborate to develop an organization system that works for your kids. Encourage them to express their opinions and preferences. After all, no organization method will work unless your child is willing to use it!
- **Lead by (honest) example.** Show your child the importance of organization in your own life. Point out how a shopping list gives direction to a trip to the supermarket. If you rely on lists, a datebook or apps on your smartphone to stay organized, talk with your child about how your personal organizing system works (or falls short). Be honest about your own organizational frustrations, so your child understands that organization is a skill that many people—even adults—struggle to master.
- **Create comfortable routines.** All of us develop routines and habits to get us through the day. Your child will benefit greatly from knowing what to expect during a typical school day and week. Keeping track of homework and assignments by writing in a planner every day gives your child a visual reminder of what needs doing.

Relish the Rewards With Your Child

Students with LD and ADHD need extra time and practice to develop these skills. But once they learn these habits, they're rewarded with greater success in school, more free time to have fun—and a sense of pride and accomplishment.



SHIFTING/ THINKING FLEXIBLY

Cognitive flexibility, or the ability to think flexibly and to shift approaches, is a critical executive function for learning and succeeding in school.

Students who have difficulty shifting also struggle to cope with unexpected changes in their schedules, routines or homework, and may be viewed by their parents and teachers as “rigid,” “stubborn” or “single-minded.” **Many children with LD and ADHD have trouble thinking flexibly.**

Why Is Flexible Thinking So Important for Academic Performance?

As students advance through grade levels and the curriculum becomes more complex, they must be able to interpret information in more than one way and to change their approaches and strategies when needed. For example:

- **Reading comprehension** requires a student to go back and forth between the major themes and supporting details and to sift and sort information while reading.
- **Written language** requires balancing important concepts and main ideas with the supporting details a student wants to communicate in writing.

- **Math competency** involves shifting between word meanings, procedures and operations.
- **Science and history** require students to use context clues to prioritize and focus on the most relevant information.
- **Foreign language** learning requires students to shift between their native language and the language they are learning.
- **Studying and test-taking** require students to go back and forth between topics or problem types that are presented in different formats.

WHAT ARE THE BENEFITS OF BEING BILINGUAL?

Scientists propose that a bilingual individual uses “executive control” functions to separate the two languages.

These executive functions are the abilities of the brain that we use for things like higher-level decision making, paying attention in a crowded coffee shop or figuring out logic puzzles.

So, as a bilingual person manages their two languages, they are effectively exercising these same brain “muscles.”

How Can You Help Your Child Become a More Flexible Thinker?

If your child needs help becoming a more flexible thinker, you could try introducing the strategies on the next page into daily activities at home, including homework and family (or solo) time.

- **Activities that involve multiple-meaning words, word categories and number puzzles** can build a child's flexible approach to language and numbers from the preschool years onwards.
- **Visualizing and discussing jokes, riddles, puns and multiple-meaning words** can help children recognize that ambiguities in language can affect meaning and reinforce the importance of using context clues when reading.
- **Reading comprehension:** When your kids come across words or sentences they don't understand, encourage them to stop reading and ask key questions such as: *Is there a word or phrase that could have more than one meaning? Can I emphasize different parts of this sentence to change its meaning?*
- **Written language:** If your child gets "stuck" on a writing task, encourage the use of strategies to organize and prioritize the information. Some tools that can assist in this are graphic organizers to help children shift between the main ideas and supporting details, and a three-column note-taking system to record major themes, concepts or questions in the first column, relevant details in the second column, and a memory strategy, such as a picture, in the third column.
- **Math:** If kids try to solve math problems in only one way, show them how to look for alternative approaches which may be more

efficient. Multiple math formats help children recognize that the presentation of problems may differ between class work, homework and tests. Encourage them to recognize the need to shift from one operation (e.g., addition) to a different one (e.g., subtraction). Have them ask questions like: *Do I know more than one way to solve the problem? Does this look similar to anything I've seen before? Is this problem the same or different from the last problem?*

- **Studying for tests and quizzes:** Show your child how to extract and memorize information from many sources, including textbooks, homework and notes. **Help kids recognize that:**
 - They need to **study differently for different kinds of tests.** A multiple-choice test requires a focus on details and facts, but an essay question depends on telling the story rather than simply cramming in details.
 - **Different study strategies may be needed in different subject areas.** For example, reviewing the major ideas in notes and textbooks is good preparation for a history test, but class work and past homework assignments are more important for math.
 - **With time, patience and practice,** you can help children become more flexible thinkers, which will in turn help them learn more and perform better in school.



WORKING MEMORY

Remember the day when someone rattled off a phone number, and you hoped you'd recall the string of digits as you were dialing?

That was working memory, which plays a key role in learning in our daily lives. While working memory isn't one of the executive functions, it's much like a foundation that supports the executive functions.

If working memory is weak, it can trip up just about anyone, especially a child with LD or ADHD. You can take steps to help a child with weak working memory, whether or not learning and attention issues are part of the picture. First you need to understand what working memory is and why it matters.

What Is Working Memory?

To understand what working memory is, see what a handful of experts have to say about it:

Children use this skill when doing math calculations or listening to a story. They have to hold onto the numbers while working with them. They need to remember the sequence of events and also think of what the story is about.

Types of Working Memory

There are two types of working memory:

1. **Verbal (auditory) working memory** taps into the sound (phonological) system. When kids have to follow a multi-step set of oral instructions, they're using these working

"It's like mental juggling. As information comes in, you're processing it at the same time as you store it."

"Working memory is your brain's Post-it note."

"It helps us keep information in mind while using that information to complete a task or execute a challenge."

"Brief by design, working memory involves a short-term use of memory and attention."

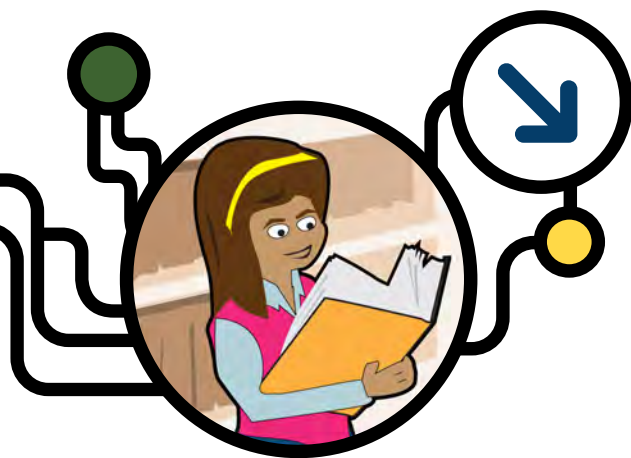
memory skills. If there's a weakness, however, they may not be able to keep the instructions in mind while working with them, even when they fully understand what to do.

Other tasks that require use of verbal (auditory) working memory are language learning and comprehension tasks. Auditory working memory usually affects learning more than visual-spatial working memory because, since so much information is relayed verbally in school, it's harder for students to easily find ways to compensate for it.

2. **Visual- spatial working memory** is like a visual sketchpad in the brain. It allows you to envision something, to keep it in your “mind’s eye.” Students use this skill to do math and to remember patterns, images and sequences of events. They might use it to visualize the layout of the classroom during the first couple of weeks of school. If not identified, a deficit of this type is ripe for misunderstanding. For example, it might seem as though a child is simply not paying attention.

How Is Working Memory Linked With Learning and Attention?

Working memory can be a major problem for kids with ADHD, and those with weak working memory are likely to have LD, too.



Difficulty with working memory may show up later in school, when executive skills of comprehension and analysis come into play. As you can imagine, then, if a child has a learning disability, weak working memory can add insult to injury. For example, a fifth grader who's still sounding out words while reading is relying heavily on working memory to help compensate. This puts a huge tax on the working memory system. At this stage, you want kids' reading to be more automatic—for them to be able to look at a word and recognize it without having to recruit attention or working memory to do the task. So, for a child who needs to compensate but can't rely on working memory, the process can become all the more painful.

How Can You Identify Working Memory Problems?

To figure out if your child has a problem with working memory, first watch for signs (or ask your child's teacher to do so). Kids with working memory problems could do the following.

- Abandon activities before completing them
- Appear to be daydreaming often
- Fail to complete assignments
- Raise their hands to answer questions but forget what they wanted to say (This is typical for a 5-year-old, but not for an 11-year-old, for example.)
- Mix up material inappropriately—for example, combining two sentences
- Forget how to continue an activity that they've started, even though the teacher has explained the steps

If you or your kids' teachers have observed these behaviors, perhaps consider formal testing. A school psychologist can assess both forms of working memory for your child.

How to Help a Child With Poor Working Memory

There are lots of ways to help children with poor working memory—from teaching them how to compensate to lifestyle changes. Here are techniques you can try (or share with your child’s teachers to try):

- **Know your kids’ weaknesses, but play to their strengths.** If your child has strong visual-spatial skills, try taking information from a math word problem and inserting it into a visual diagram. For instance, try using blocks or Legos to complete addition and subtraction problems.
- **Help compensate for a weakness.** Break up or chunk information. This takes up fewer “slots” in working memory. For example, give one or two instructions rather than a long string of them. If auditory working memory is weak, don’t expect them to depend on it for important things. Encourage them to advocate for their needs by asking teachers for this kind of “information management.”
- **Reinforce what works.** Help your children develop awareness of their own working memory, and help them identify what strategies work well in certain situations. If something works, suggest that they try it again.
- **Use working memory as a floodlight to plan action.** Discourage multitasking, and use working memory like a spotlight to focus on one thing at a time and shift between activities. Do one activity and stop and shift to the next and maybe come back to the first, and so on. By being mindful like this, kids can focus on a single thought—rather than be overwhelmed by a mountain of thoughts at once.

SELF-MONITORING/ SELF-CHECKING

Self-monitoring is an executive skill that requires students to recognize when and how to use specific strategies, check the effectiveness of these strategies and adjust strategies in relation to the task at hand.

Self-monitoring requires students to be mindful of what the task is, how they’re approaching the task, as well as the outcome of their effort.

Why Is Self-Monitoring Important for Academic Performance?

Self-monitoring and self-checking strategies become increasingly important as students advance through grade levels. For example:

- **Reading comprehension** involves monitoring and decoding vocabulary (the mechanics of words), while also tracking the main ideas and details (the meaning).
- **Writing** involves understanding an assignment, planning and organizing an approach, connecting the main ideas (or themes) with the details and facts—while using correct sentence structure, spelling and grammar, and finally checking to see if the finished product matches the goals of the assignment.

- **Math** requires students to monitor how they solve problems (such as using the correct operation), understanding concepts, and making sure the final calculations match the questions.
- **Science and history** call on students to be aware of their understanding of concepts, vocabulary (like scientific words) and details (like historical dates).
- **Homework** involves understanding assignments, monitoring due dates, organizing materials and checking for accuracy.
- **Studying and test-taking** involve monitoring what students already know, what they still need to learn and how to do so, and checking over completed work for errors.

CHILDREN AND TEENS WHO
DEVELOP THE ABILITY
 to self-check can become independent,
 efficient and successful students.

What About Students With LD and ADHD?

Students with LD and ADHD often have difficulty self-monitoring effectively. They don't check or correct their work efficiently. They often lose sight of their goals and objectives. They may not select the best strategies for specific tasks, and they can't easily spot their errors. Instead, they might spend hours working, becoming increasingly frustrated because they often:

- aren't aware of the approaches they're using to complete assignments;
- don't recognize when they're "stuck" and need to shift to a different approach to complete work;

- don't independently monitor and adjust the strategies they use;
- don't know how to check or correct their errors independently.

How Can You Help Your Child Learn to Self-Monitor and Self-Check?

Self-talk promotes reflection and greater awareness of one's learning and performing process, so encourage your child to think out loud! You can model this behavior by talking through your own checklists, reviewing and revising plans and discussing how to avoid errors.

To help your kids self-monitor their schoolwork, try the following strategies:

Reading Comprehension

- Encourage your child to read single sentences or small chunks of text, and then check for understanding.
- Teach your child think carefully about text by discussing the characters, language use and connections between themes and details.

Writing

- Help kids review assignments and the outcomes of those assignments to track progress.
- Help them review their most common errors and, from there, create a personalized list of errors to watch out for.
- Suggest that they use different colored pens when shifting from the role of writer to that of self-editor.
- Encourage them to check sentence structure and grammar by reading aloud or using text-to-speech technology.



Math

- Show kids how to check work for accuracy by checking against an estimate, using the reverse operation, using a calculator, etc.
- Help them create a personalized checklist by identifying past errors on tests or quizzes. For example: *Have I checked the signs? Have I solved all parts of the problem?*

Homework

- Help your kids come up with silly phrases or songs as reminders to pack necessary books and folders in their backpack when leaving school or when leaving home in the morning.
- Encourage them to give finished homework a “once over” to learn the habit of self-checking.
- Keep a clock nearby so they can monitor the time spent on each assignment.

Studying and Test-Taking

- Review study guides to help them set up a study schedule—one with breaks built in for exercise and enjoyment.
- Encourage them to create a list of “don’t forget” items, acronyms or reminders to review before tests.
- Help them create acronyms as reminders to check for specific errors during and after a test.
- Show your child how to use two- or three-column notes to study and check for understanding of major themes. For example: one column for main ideas/terms, one for details and another for memory aids.

Children and teens who develop the ability to self-monitor and self-check can become independent, efficient and successful students.

SECTION III

EXECUTIVE FUNCTION, BEHAVIOR & EMOTIONS

Do you ever think of your children as being lazy, apathetic or stubborn? Do they have trouble getting started and procrastinate with homework? Motivation is one component of executive function, so a lack of motivation may indicate executive dysfunction. Different aspects of executive function—emotion, attention and behavior—develop together and impact each other. In a child with executive dysfunction, it may be difficult to tease these apart. Following are some tips for identifying what may be robbing your child's motivation.

Pinpoint the Problem

You need to do a little detective work to figure out why kids have trouble initiating tasks or fall apart before they even begin. There are some formal tests that professionals can use to assess motivation, but there are less formal ways for you to get to the root of your child's problem. Here are some questions to answer and approaches to try.

Do Your Kids:

- Simply not understand what you're asking them to do? You can check for comprehension by having them repeat instructions back to you.
- Know what to do, but not how to do it—as in, what to do first or second, and how these steps fit together? See what happens when you give a prompt such as, "First, you need to do this."
- Get frustrated and lose motivation easily? This happens because the same part of the

brain that serves emotional regulation also influences motivation and other executive function skills.

- Lack motivation? They understand how to do it but don't care or think there's nothing in it for them. If you've ruled out problems of understanding or skill, then poor motivation is a more likely culprit.

How to Help Your Child Feel Motivated

Once you've pinpointed the main problem, try these tailored tips to boost your kids' motivation.

- If they don't seem to understand what you're asking, simplify or condense instructions or make them more concrete. This is particularly important for children with working memory problems and those with language-based LD.
- Make sure they can actually do what you're asking them to do. Target the task or assignment to their developmental or skill level so they'll be able to accomplish it. This will help them develop intrinsic motivation.
- If they have trouble getting started, try providing a cue or some kind of structure, such as a checklist. Then, if you ask, "Where's your checklist?" see if they pull it out and get started without additional prompts every step of the way.
- The *perception* of challenge also really impacts children's ability to accomplish a task. In other words, if they perceive the task as being too difficult, even if they have the ability to do so, motivation stalls.

For example: You have two math worksheets—one contains 10 simple problems, the other has just a single hard problem. To a child with executive dysfunction, the second worksheet might actually look easier because it's just one problem.

- Focus on tasks that include your kids' interests and hobbies, even if they aren't school subjects.
- When possible, offer children choices. This includes what to do as well as how to do it. Autonomy is motivating.
- If you've ruled out a problem of skill and they're still not engaged, offer a reward that's personally motivating to them. This could be video-game time or access to the family car.

Praise your child's effort. Be as specific as possible by pointing out a particular task, habit or accomplishment. Don't overdo it and be sincere, since even young children know when they do and don't deserve praise.

It takes time, patience and practice to find ways to successfully motivate kids with executive function difficulties, and you'll need to adjust your approach as they develop.

Tantrums, Meltdowns and More: Executive Dysfunction and Behavior

Executive function skills allow us to control our impulses and emotions, be flexible, plan and organize. These cognitive skills are crucial for learning but also influence day-to-day behavior. Children who struggle with executive function may have great difficulty behaving appropriately at school, at home and in other settings.

Behavior and Emotional Control in Kids With LD and ADHD

Because many children with LD and ADHD have executive dysfunction, some of them also tend to struggle with their behavior and emotions.

Consider kids who are known to be troublemakers. They respond excessively to everything, good or bad, and are impulsive and prone to temper tantrums. They don't respond well to change and seem unable to control their emotions. They may lack the executive skills most closely related to social and emotional growth, including impulse control, emotional control, flexibility and self-monitoring.

It's important to consider the role executive function may be having on kids' behavior. This will help you avoid the trap of blaming them for all of their inappropriate behavior and instead look for ways to help them improve executive function skills and behave in more positive ways. Remember that executive-skill development is gradual and developmental, not automatic.

Controlling Impulses and Emotions

We all speak and act impulsively at times, and who hasn't had to apologize for doing so? Every time you consider the consequences of an action before you act or hold back a comment until an appropriate time, you're exercising an important executive skill: the ability to control your impulses. This can be a huge challenge for children and teens who struggle with executive function, and especially for those with ADHD. Kids who are lacking in impulse control have a diminished ability to regulate their speech and behavior. They find it difficult to stop and think.

They haven't learned to ask: *What's happening here? When this happened to me before, what did I do? If I say this or do that, will I help the situation or make it worse?* They have trouble following rules and directions and sitting still in class. They may seem to talk incessantly and interrupt others.

Closely linked to impulse control is emotional control—the ability to manage emotions so they

don't control our lives. When your child isn't invited to a birthday party or when your teen gets a speeding ticket, frustration, anger or even fear are normal emotional reactions. However, throwing a tantrum, becoming silent and withdrawn or arguing with a police officer are unproductive, self-destructive ways to react. The ability to monitor emotions so they don't spill out and cause embarrassment (or worse) is a crucial executive skill that helps avoid difficulty in all kinds of interpersonal situations.

Children who struggle with emotional control may have a low threshold for frustration. They may overreact to obstacles that wouldn't affect other children. Without a strong capacity for emotional control, their overreactions may rapidly escalate, leading to rage, tears or withdrawal. Even happiness may affect them differently, leading to excessive giddiness or silliness.

Flexibility and Self-Monitoring

Does your child's behavior get worse during school breaks or vacations, while away from normal routines? Does your child struggle with understanding the difference between an "outdoor" and "indoor" voice? These difficulties may be related to executive function: Cognitive flexibility, or the ability to think flexibly and to shift approaches, is another executive function process that can lead to behavioral problems when it breaks down.

Think of it this way: Every time you switch from one activity or setting to another, you know that there are a different set of rules and expectations for how you will act. You wouldn't behave exactly

the same way in a meeting with your boss as you would when you're out to lunch with your co-workers.

Children and teens who struggle with this aspect of executive function have trouble shifting their behavior from one situation to the next. For example, while running might be okay at recess, it's definitely against the rules in school hallways. Kids with executive dysfunction may have trouble switching from "recess behavior" to "classroom behavior," continue to run when recess is over and get in trouble for doing so.

Tips for Promoting Positive Behavior in Children With Executive Dysfunction

With parents' guidance and support, children and teens can improve their executive functioning skills and, in turn, improve their behavior. Here are some tips:

- **Make sure kids receive a comprehensive assessment**—including aspects of executive function and behavior. Based on the results, you and school staff can determine the most important behavioral skills they need to work on. A focus on executive function skills can improve not only kids' behavior, but their academic performance as well. If your child has an IEP or 504 plan, be sure that specific executive-skill guidelines are included.
- **Communicate with teachers** and other school staff about your efforts to help your child regulate behavior. You and your child's teacher or counselor may decide to work on the same skill at the same time. Home and school need to reinforce each other.

THEY HAVEN'T LEARNED TO ASK THEMSELVES:

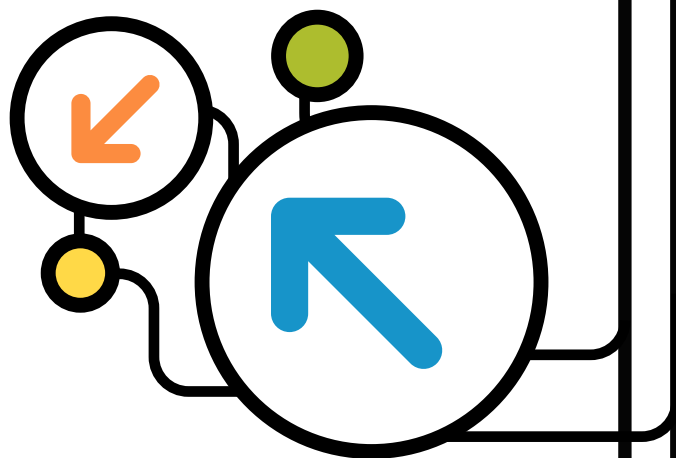
"What's happening here?"

"When this happened to me before, what did I do?"

"If I say this or do that, will I help the situation or make it worse?"

- **Set clear and consistent rules.** Children need to know what language or behavior you won't accept (for example, violence, name-calling, abusive or profane language, door-slamming, harming themselves or others). Discuss consequences for breaking the rules and be consistent in applying them. Beyond this zero-tolerance list, treat any tantrums or meltdowns as problems to be solved cooperatively. Research clearly shows that the best way to see improvements in social skills is to give kids positive reinforcement.

Children and teens with LD or ADHD need extra help in many areas of life, including the development of self-control, resilience and sensitivity towards their own and others' feelings. Your efforts to help them develop these skills will serve them now and throughout life.



SECTION IV: EXECUTIVE FUNCTION IN SOCIAL SITUATIONS & RELATIONSHIPS

How Executive Dysfunction Can Cause Trouble Making Friends

Dealing with executive dysfunction can lead children to experience a variety of problems in their friendships, peer relationships and other social interactions. Everyday tasks like sharing, taking turns, picking up on subtle social cues and staying attentive in class can be very difficult for kids who struggle with executive skills. And when children and teens falter in these basic social interactions, it can hurt them socially—isolating them from peers and making it difficult for them to make and keep friends.

Difficulties in the social realm can cause them pain and embarrassment, and this is particularly painful to witness as a parent. Everyone needs to feel liked and accepted, and children and teens may react to social disappointments with feelings of isolation, helplessness, sadness and anger. The good news is that you can help your child handle the social challenges that can come along with executive dysfunction, just as you assist your child with academic difficulties.

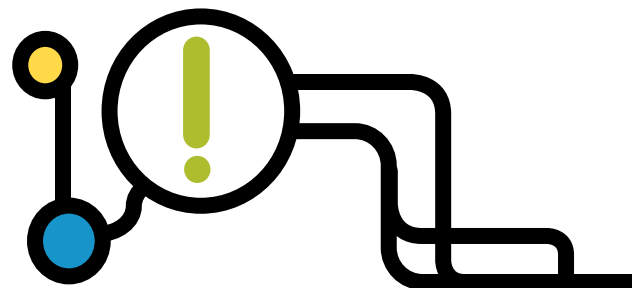
What Is Social Competence?

Being socially competent calls on a variety of executive function skills, some that are unique to social relationships and others (which you'll recognize in the following bullet points) that

overlap with academic performance and behavior. Children who are socially competent exhibit the following characteristics.

- Are aware of the importance of body language and nonverbal communication
- Have control of their emotions and impulses—they can “stop and think”
- Have the ability to think through a situation and recognize others' points of view
- Show flexibility in the face of changed plans and unexpected situations
- Can anticipate what will happen as a result of their words or actions
- Are able to take responsibility for their behavior

Executive dysfunction can throw a wrench into all of these skills. For example, kids with weak working memory may struggle to think through a social situation before taking action. Teens who have difficulty with self-monitoring may not be able to judge others' reactions to their body language and voice volume and adjust what they're doing accordingly. Social difficulties such as these can cause a child to feel lonely, have few friends and even suffer rejection or bullying by peers.



Why Can Social Life Be So Difficult For Kids With Executive Dysfunction?

Research has shown that children and teens whose executive skills are underdeveloped are:

- More likely than their peers to behave in socially unacceptable ways (like saying the wrong thing at the wrong time, running into things and people, talking rapidly and excessively or continuing to roughhouse after peers have stopped).
- Less able to solve interpersonal problems.
- Less likely to consider the consequences of their behavior.
- Less likely to understand nonverbal communication, such as facial expression and tone of voice, or to interpret what others say.
- Less adaptable to new social situations.
- Less able to tolerate frustration and failure.

How to Help Your Child Develop Better Social Skills

Social skills, just like academic skills, often must be taught explicitly—especially to children who struggle with them. Here are some ideas.

Problem Solving and Discussion

You can use typical problem-solving steps to help children with executive dysfunction become more socially competent. The following is one sequence, but the steps may be ordered differently depending on the circumstances.

1. **Get to the root of the problem.** Watch kids in a variety of social situations (classrooms, team practices, club meetings, free play, birthday parties, family events or interactions with adults and peers). Just observe, intervening only if they start fighting or seem in danger.

BULLYING FAST FACTS

The U.S. Department of Education (DOE) defines bullying as behavior that is (1) aggressive, (2) indicative of an imbalance of power and (3) repeated.

- Bullying can take many forms, from physical attacks to verbal, emotional or social behaviors, to cyberbullying.
- According to DOE, 60 percent of students with disabilities are bullied or harassed each year (three times higher than the general population of students!).
- The average bullying episode lasts only *37 seconds*.
- School personnel are reported to notice or intervene in only one in 25 incidents.

**What can you do to address bullying?
Find out on LD.org.**

2. **As you observe, be sure to notice their social strengths as well as weaknesses.** Even if you notice something positive only once, remember to mention it to them.
3. **Begin a conversation with them.** A good way to start talking is to say, “Let’s see if we can figure out (why that happened, why he said that, why you got so angry).” As you talk to them, try hard not to respond judgmentally or angrily. Ask questions that show you value their perception of the problem. Listen to them and make sure you understand their side of things and acknowledge painful, angry or sad feelings.

4. **Decide together on one alternative** way to handle a similar situation in the future.
5. **Invite them to practice the alternative behavior with you.** If they're receptive, try role-playing. While this can't equal the emotional intensity of a real encounter, it does allow them to practice thoughtful responses to difficult real-life situations.
6. **After they have a chance to discuss the alternative behavior in a real situation with peers,** discuss what happened. Did the situation end better this time? If not, what else could they try?

Teach With Signals

Once you've discussed what social situations are challenging for them, try designing a simple signal to use (in situations where you're around) to let them know that a behavior should stop or change. For example, if you're working on understanding when to stop talking about a subject because the listener is showing disinterest, quietly get their attention and touch your nose with your index finger or cross your arms. When they stop talking on their own, give them a thumbs-up.

Generalize Skills

Broaden the circumstances calling for a particular skill so they can apply it more generally. For example, try saying: "You really did a good job controlling your anger when your brother borrowed your skates without asking. How would you control yourself if someone borrowed your markers without asking?" This helps children who struggle with cognitive flexibility learn how behaviors can be applied in different situations.

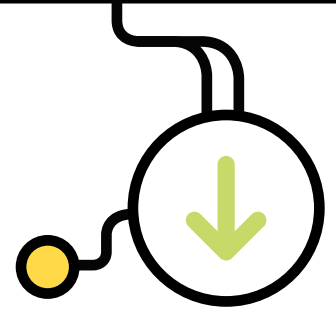
Stay Nonjudgmental... Even When It's Hard

It can be hard to stay neutral when listening to kids complain about "unfair" treatment (that you know originated with your child's difficulty with social skills). But it's crucial to remain nonjudgmental as you show your concern and offer to help. For example, instead of saying, "Why did you keep interrupting? Didn't you see how annoyed Bryan was? You have to let other people talk!" say, "I know you feel bad about Bryan's walking away from you. Why do you think he did that?" Before you make any suggestions, listen until you understand their perception of what happened. Then ask, "Do you think it would have helped if you'd let him finish telling his story? What could you do differently the next time you talk with him?"

Be There for Your Child

Perhaps most importantly, provide consistent, ongoing encouragement and support. Recognize and reinforce even the smallest improvement. Children or teens with social challenges probably have low self-esteem. Knowing that you care and notice their progress can be very reassuring. However, try not to over-praise—even young children can sense insincerity. Simply show them that you appreciate their efforts.

Watching your child develop better social skills and relationships—and the rewards that come with them—can be one of the most gratifying experiences of parenting. When kids have executive dysfunction in this area, it can make your job as a parent more challenging. But since social skills affect nearly every aspect of life, the time and effort you spend to help your child is a gift that will last a lifetime. ■



ACKNOWLEDGEMENTS

Many people contributed to the creation of this e-book, and they deserve our gratitude. Sheldon Horowitz, EdD, offered valuable guidance on both the topic and the creation of the book. Kaleigh Dumbach-Fusco served as both an editor and writer; she also wrote the story depicted in the infographic, “Executive Function Around the Clock.”

Designer Fil Vocasek brought our words to life in the book’s design and in his rendering of the infographic. Writers Bonnie Goldsmith, Darla Hatton, Kaila Hatton and Annie Stuart carefully researched and wrote many of the articles upon which the book is based.

The Research Institute for Learning and Development (ResearchILD)—Lynn Meltzer, PhD, Michael Greschler, MEd, Kalyani Krishnan, MA, and Nancy Trautman, MAT—wrote articles for NCLD upon which some of the content of this e-book is based. ResearchILD is a non-for-profit educational and research organization that works to transform the lives of children, adolescents and adults with learning difficulties including dyslexia, ADHD and executive function problems.

-Editors, Laura Kusnyer and Kristin Stanberry

Works Cited

Meltzer, L.J. (2010). *Promoting Executive Function in the Classroom*. New York: Guilford Press.

Meltzer, L.J. (Ed). (2007). *Executive Function in Education: From theory to practice*. New York: Guilford Press.

 National Center for Learning Disabilities

Visit us online at LD.org

 www.facebook.com/LD.org

 @LDorg