



“Devon” – age 12

Program Hours: 75 hours

Program Goals: To improve executive functioning (i.e., self-monitoring, planning, organizing, prioritizing, impulse control, etc.) by strengthening automatic processing skills

Devon’s mother sought a COGx program for Devon due to issues at home and in school, primarily surrounding her executive functioning skills and a negative attitude towards learning that stemmed from years of struggle.

Devon was easily frustrated if she provided responses inaccurately and indicated that she does not like “getting things wrongs.” Concurrently, her self-ratings of her own performance, confidence, level of effort and cooperation were typically a 5 (i.e., on a rating scale of 1-5) even if her answers were inaccurate or her effort/cooperation was poor. To confirm that Devon interpreted the rating scale appropriately, we switched roles (i.e., Devon pretended to be the trainer and I pretended to be the student). When asked to rate my level of performance on certain tasks, she did so accurately confirming that her inaccurate self-ratings were a result of low self-awareness. Discrepancies were regularly used as teaching moments (i.e., “*Why do you think my rating doesn’t match yours?*”). Through constant drill and practice, Devon’s self-reported ratings have become more in lined with her actual performance. Additionally, by placing an emphasis on Devon’s effort (e.g., assigning small rewards such as a game for the effort placed on completing an exercise with *fewer* errors), she was able to recognize that the primary focus is progress, not perfection. This shift allowed Devon to feel more comfortable completing exercises of high intensity and sharing her thoughts regarding personal areas of difficulty (e.g., “*I forget to write things down and take books home. Staying organized is hard*” - Devon).

To further monitor her mood, Devon was asked to specify how she was feeling (i.e., based on a worksheet of feeling words), at the start of each session. On days where Devon endorsed feeling tired, annoyed, or frustrated she frequently demonstrated irritability and required redirecting whereas, on days where Devon endorsed feeling calm/happy, she required minimal to no prompting during the session. When negative emotions were endorsed, I dedicated a few minutes of session to a short game of her choice or a brief opportunity to discuss why she was upset or frustrated. Allocating this time to an activity of preference helped increase engagement throughout our sessions. Long-term rewards were also implemented to increase motivation (i.e., earning points toward a gift card based on level of effort, cooperation, and performance); however, Devon appeared to respond better to immediate rewards (e.g., playing a short game of her choice after meeting a designated goal on a task).

Devon learned how to implement strategies such as visualization or visual aids to assist in holding onto information in memory. Now, Devon is able to hold greater quantities of visually and verbally presented information without assistance (e.g., visual aids). Since Devon no longer relies on rote memorization to hold information, impulsivity in providing her responses declined. Similarly, with improvement on working memory tasks, her responses became more prompt on tasks that target executive function. With improvement in her automatic processing skills, we were able to target executive function more directly.

When presented with tasks that target organization and planning, Devon demonstrated resistance toward sharing information regarding her homework, school assignments, and chores. To indirectly



target organization, I introduced several scheduling worksheets, during session, which listed a set of assignments, chores, and activities of a pretend student. Devon's task was to prioritize and organize the assignments/tasks into a scheduling grid based on the amount of time allocated per item. Initially, Devon demonstrated significant difficulty interpreting a scheduling grid and following the instructions of the task, even after reviewing the assignment together. Several modifications were made to accommodate these difficulties. First, I broke down the instructions into smaller steps. I then included a checkbox next to each step that was to be check off once she had thoroughly read through that step (i.e., following a linear, checklist format). Since Devon had notable difficulty with linear thinking (i.e., referring to or organizing information in appropriate sequence), these simple modifications demonstrated large outcomes as Devon began completing the assignments in appropriate sequence, at a faster rate, and with greater accuracy. After completing several versions of this exercise, Devon was able to appropriately prioritize and time manage her own school assignments/activities, independently, using a scheduling grid.

To target chores and assignments at home, Devon was introduced to a daily checklist. She was asked to organize her homework, chores, and activities in this format, during each session. To hold Devon accountable, she was asked to seek parent's signature and feedback to insure that she was referencing the list at home and completing the tasks that were checked off. Devon demonstrated full capacity to independently create a checklist and organize the items, appropriately (e.g., listing school tasks then in-home tasks). When planning for long-term assignments, Devon implemented a similar format—a weekly checklist. In session, Devon was provided with a pretend long-term assignment that was supposedly due at the end of the week. Devon was required to seek the information needed to complete the assignments and plan her week, accordingly. She was typically given a broadly stated assignment (e.g., you have a science project due on Friday and you need to include a poster). Without prompting, Devon asks a sufficient amount of questions to gain the information needed to complete the task (e.g. What is the topic? Do I need to include a report?). She breaks down the assignment into steps and efficiently organizes each step in appropriate sequence throughout the week (e.g., On Monday - buy supplies that I don't have at home, Tuesday - refer to my book and make an outline, etc.). Devon has demonstrated full capacity to effectively and efficiently plan for long-term assignments, independently.

(Of note, most mock assignments applied to these exercises were formulated were based on Devon's current subjects, their level of difficulty, and typical assignments she receives in each class.) Through constant drill and practice, Devon has learned how to implement numerous strategies that target planning and organization. With increased self-awareness, Devon can articulate her personal areas of difficulty and appropriately specify the strategies/techniques that most effectively target those difficulties.

Thank you for all that you've done for Devon and teaching her skills she can use in the future - Parent



“Maggie” – age 10

Program Hours: 60 hours

Program Goals: *Reduce impulsivity; strengthen automatic processing skills (i.e. attention, processing speed, & working memory); and improve executive functioning*

At the start of Maggie’s program, she demonstrated a tendency to quickly provide responses during tasks, but consequently, made frequent errors. She was easily distracted by external (e.g., noise) and internal (e.g., thoughts or stories she wanted to share) stimuli, and required frequent prompting to remain on task. To reduce impulsivity, the metronome was used to modify the rate in which she provided her responses (i.e., following a slow to moderate beat). Initially, Maggie had difficulty staying on beat and reducing her pace. When errors were made as it relates to her speed, these errors were used as teaching moments to increase awareness (i.e., “What could we do differently to avoid making similar errors? *Student: Go slower. Give myself time to think.*”). Throughout the course of her program, Maggie has demonstrated improvement in her ability to remain on task for a longer duration and prioritize the accuracy of her responses.

With progress made in Maggie’s attention, she demonstrated significant improvement in her working memory. She is able to hold double the amount of information within a short duration (i.e., shorter viewing time) and manipulate the information with higher accuracy. She initially required modifications (i.e., visual aids) for these tasks but gradually moved away from these aids. Maggie learned strategies that allowed her to create meaning out of non-contextualized information, which served as an aid to storing greater amounts of information.

Another focus of Maggie’s program was executive function (i.e., self-awareness/metacognition, planning and organization). Parent and teachers endorsed difficulties with organization of her school materials and planning for the completion of tasks/assignments. We worked to designate every compartment, location, and section of her backpack, locker, and folder, respectively to specific materials. We utilized schedules and checklists as well as a weekly “check-in” to monitor the consistency in maintaining her materials organized. Maggie is able to decipher which tasks to include in a checklist and is able to create one, independently. She knows how to formulate a daily schedule and has shown great improvement in her ability to regulate the amount of time needed to complete certain tasks (i.e., time management). Most importantly, Maggie’s self-awareness has resulted in a positive shift in her behavior. She is more aware of her learning process and the things that interfere with ability to focus (e.g., lack of sleep, noisy environments). Maggie is now able to recognize strategies and methods of aiding her ability to remain on task (i.e., “...find quiet time, make a checklist and look to see what I have to do”) and has become a more independent and organized learner.

*I have to say how much she has improved. I see a massive improvement in her ability to stay on task and stay focused – **Parent***

*It’s unbelievable how much her self-awareness has improved - **Parent***



“Yara” – age 11

Program Hours: 70

Program Goals: Improve weaknesses improve processing speed, attention (primarily sustained attention), and executive functioning; improve visualization to support spelling ability and reading comprehension.

On Yara’s first day, Yara shared in her own words why she was signed up for the program, specifically that she had trouble following directions that adults gave her. It was because of this self-awareness and willingness to put in an effort that we instantly got off to a great start.

Before addressing Yara’s executive functioning behaviors, attention, processing speed, and visualization to improve her spelling and nonverbal learning in the classroom were the first focus. Metronome training was effective with Yara and it allowed us to work through tics and behaviors she engaged in when rushed. At first, Yara panicked over small mistakes and sabotaged her own effort. Modifications and behavioral measures were put in place to allow Yara to gauge her own performance, which allowed her perspective on her minor mistakes and improved her ability to work through tasks.

In time, Yara internalized that when she struggled or made mistakes, it just meant this was where she needed to be to learn.

Yara’s attention improved along with her visualization. Naturally creative, Yara took quickly to visualization techniques and began applying them outside sessions without prompting from her trainer. Eventually, this improved Yara’s ability to process information quickly, both verbally and nonverbally.

As she improved her visualization, this was applied to improve her spelling ability as well as following multi-step directions. Several exercises were customized to leverage Yara’s improvement in visualization in order to target these other skills. Visualization was also leveraged in addressing executive functioning through a variety of activities that required she re-order her thoughts and actions.

After only a few weeks working together, Yara’s motivation and confidence were clear when she asked how she could apply specific memory techniques to her schoolwork. Before long, Yara was applying techniques, primarily association, to her vocabulary and social studies homework.

In addressing executive functioning habits, Yara was provided with tools to help her schedule her study time and maximize her efficiency. This was first done in session with hypothetical situations as well as material provided by teachers.

Yara is like a different student in the classroom. She is more organized and is able to pay better attention. – English Teacher

In the home, she did seem to mature. I noticed less misplacing and losing things. She is able to remain more organized. – Parent



“Flynn” – age 8

Program Hours: 90

Program Goals: Flynn’s program was customized to address automatic processing and number fluency. Long-term memory and logic and reasoning skills were relatively high, while his processing speed, short-term memory, and working memory were very low. Flynn also had very impulsive behaviors that were to be addressed. Parents raised concerns regarding working memory, and work avoidance, and wanted Flynn to learn skills to help through difficulties in academic areas (especially basic math facts).

A 3rd grade student at The Newton School in Sterling, VA, Flynn originally enrolled for 60 hours of cognitive training. An additional 30 hours was recommended and completed.

Flynn was a very willing participant from the beginning of his program and enjoyed working on the exercises. The most crucial areas of focus were on Flynn’s processing speed, short-term memory, working memory, and attention. The trainer incorporated concepts of time and numbers into every applicable exercise to help Flynn work more quickly and efficiently, while reinforcing numerical fluency. In addition to drill and practice, the trainer equipped Flynn with tools like visualization and linking. With these tools combined Flynn was capable of stretching beyond his short-term memory baselines, and began storing information at increased paces.

Flynn’s second half of the program was primarily focused on numerical fluency. This involved a lot of drilling and use of memory techniques learned in the first half of training. Flynn’s improvements with short-term and working memory were seen in his ability to recall and solve math equations at increased times. Flynn’s ability to recognize number values also improved from the use of highly visual components.

The biggest challenges during Flynn’s program were the inconsistencies of attention and self-regulation. Flynn often had days where it seemed his ability to control his impulsivity did not exist. This made it challenging for the trainer to be productive and structure the class. However, towards the end of training, Flynn’s off days appeared less often. Flynn took extreme interest in generalization, and was anxious to incorporate the techniques he learned from training into his everyday schoolwork. Flynn enjoyed the ways in which his trainer helped him learn more efficiently in a visual manner that was adapted to how he best learns.



“Ryan” – age 12

Program Hours: 70

Program Goals: Improve processing speed, impulse control, attention span, and follow multistep instructions.

Ryan was a 12-year-old male sixth grader enrolled in COGx through a school partnership for a 70-hour training program. He was eager to improve his ability to focus through COGx training. When he was completing any exercise that he was not interested in, just tapping a pencil would be enough to distract him from staying on task. By the end of his program, however, these types of distractions no longer fazed him. In fact, even when more aggressive attempts and disrupting Ryan’s focus were intentionally made, like trying to engage him in conversation by discussing topics of interest to him, Ryan replied, “It’s difficult to pay attention when you’re talking about something interesting!” By the end of training, he was able to “tune out” distraction completely and focus on the task at hand. This also led to him increasing his accuracy and speed on these tasks.

Ryan learned various techniques that have improved his ability to retain a large amount of information in a short amount of time. He has also increased the speed in which he can recall this information. The techniques he used primarily to help with his long-term memory include chunking, linking, and visualization. His favorite technique was linking, which not only improved his memory but also his auditory processing. Initially, Ryan would struggle with remembering short amounts of information that were verbally stated. By the end of his program, he could recall significantly larger amounts of information that were provided to him verbally.

Ryan’s visualization skills improved his ability to recall information that was provided to him verbally as well. He could create a visual aid that would help him recall seemingly unrelated information for both long-term and short-term memory. Since Ryan’s auditory processing and visualization skills improved, his ability to recall and follow multistep instructions increased dramatically. Since Ryan liked to use his imagination, he has been able to use his creativity to improve his linking and visualization techniques, which has increased his memory capacity and his attentiveness.

I like to use linking to help remember information. It’s really helpful when studying for school. I can also use it if someone gives me directions. Focusing during class has become easier too. I can use my imagination to help me remember information, which has helped me pay attention in class. – Student



"Adam" – age 6

Program Hours: 60

Program Goals: Improving attention and concentration, especially when instructions are being given, as well as organizing thought process and execution.

At the start of his program, Adam had particular trouble with following directions, especially when they require more than three steps to execute. When explaining new activities, he usually needed to have it modeled for him or needed several trials before he could grasp the concept of what was being asked of him. However, Adam demonstrated great effort and kept his attention on tasks despite the difficulty.

Adam also struggled with making connections between ideas when a connection was not obvious, which became a focus of his program. He also struggled with language and organizing his thoughts. When describing a picture, for example, he often struggled to communicate what he saw and provided vague descriptions. Adam's working memory also sabotaged skills like spelling because he had a hard time holding the information in his head.

Adam's ability to organize his thinking and follow directions greatly improved. Eventually he required little prompting and was able to provide clear direction and descriptions that accurately communicated his thoughts in an age-appropriate way. Adam's cognitive flexibility also tremendously improved and he became more capable of "switching gears" from one idea or concept to another. This was accomplished by applying metronome training, and then targeting Adam's metacognition and awareness.

Adam would often become frustrated and easily overwhelmed, but this greatly reduced as he mastered exercises and internalized his improvements. Soon, Adam was asking to make things more difficult and eagerly working through difficult challenges despite the fact that this meant failing along the way and potentially becoming frustrated. In fact, when told an exercise was going to be made more difficult, Adam now smiles and remarked "yay!" because he understood even at his young age that this was representative of growth.

Overall, Adam's greatest improvements were his ability to make connections, follow directions, organize his thoughts, and persevere through adversity.

We've seen a marked improvement across the board. He no longer quickly leafs through books but instead takes his time, really looking at what he's seeing. His memory has improved and he is more "with it". All around, we are thrilled and awed by the changes we've seen. We never thought we'd be able to see the boy that we're seeing today. – Parent

So many of the beautiful parts of him have been able to come out and we're seeing the real him and able to enjoy him so much. I think he's also able to enjoy himself and his life. It seems as though he's able to make more sense of the world around him; it makes sense that along with this would come a decrease in his anxiety. – Parent