The Role of Attention & Executive Functioning in the Process of Learning
Chat Q & A from 1/18/2012

1. Q: Would you please express your opinion of the role of Neuro-feedback training as an intervention for problems with executive functioning?

A: There are professionals who are able to show good results using Neuro-feedback. It’s not a front line treatment because the improvements in frontal lobe activation have not been shown in research to be consistently effective or lasting. However, with that said, it does work for some patients. If there has not been increased frontal lobe activation after about 5 treatments, then you should probably look to discontinue. Also, young kids (about 6 or younger) and those with ID or receptive language difficulties may not be good candidates because of the need to understand what is being asked of you during treatment. There needs to be some level of insight.

2. Q: Has anyone heard of ADHD being misdiagnosed as Asperger’s or vice-versa

A: Yes, in my experience Asperger’s and ADHD have a tendency to get mixed up at an early age, not through any fault of examiners, but probably more tied to development. Typically, until a child has the opportunity to exhibit the social deficits we expect with Asperger’s they appear to be dysregulated, inflexible, and disorganized, all of which are ADHD-typical qualities. As I mentioned in the webinar, Bipolar is also often initially diagnosed as ADHD in young children.

3. Q: What is a "coup or contrecoup" injury?

A: A coup injury occurs at the site of impact. A countercoup injury is on the side opposite of impact and it occurs because of the brain collides with the inside of the skull when the head abruptly stops. This happens most frequently in areas where plates of the skull fuse together, which forms protrusions inside the skull. So for example, if a person hits their forehead, a coup injury could occur in the frontal lobe, while a contrecoup injury could be to the occipital lobe.

4. Q: What is the book with these grades expectations?

A: I compiled the list of grade expectations from a variety of sources, including developmental literature, norm-referenced assessment expectations, and throughout my clinical work with children in school settings.

5. Q: I know I am going back a little. The football player you mentioned earlier, Shane Dronett, I wanted to know what was the name of the disorder he had?

A: Shane Dronett was diagnosed with chronic traumatic encephalopathy postmortem. There is a number of recent NFL, NHL, and other professional athletes who were also diagnosed postmortem, including Chris Henry, Mike Webster, and others.
6. Q: Are there EF related typical grade expectations for preschool, KG, and 1st grade?? Or is their EF not developed enough to have expectations?

A: These may be referred to as self-regulation in younger children.

7. Q: How do we intervene with a 7th grade student presently struggling with 2nd grade expectations?

A: A thorough evaluation is probably in order. With such cases, unless the student is Intellectually Disabled, there may be some cognitive or emotional developmental weakness that is inhibiting their progress across academics. Without further information it would be difficult to give more detail to this answer.

8. Q: What about preschoolers by kindergarten year?

A: Many researchers discuss the importance of self-regulation in younger children - cognitive as well as behavioral.

9. Q: In your opinion does rapidly developing technology impact executive functioning with adolescents, adults?

A: I would consider technology as an externally focused support in many cases, which may be beneficial. In many cases, a person’s organization and planning are as good as the strategies they use to support them. However, there is some debate currently about the impact of technology on cognitive development in children.

10. Q: How does environmental trauma affect the development of executive functioning in the brain during the first 12 years of life?

A: I’m not sure what you mean specifically by environmental trauma, so I will gear my answer toward specific trauma to the brain, such as in TBI. First, it’s important to note that executive functions are often the most affected by injury to the brain. When there is damage to the brain regeneration is rare. However, human brains have some degree of Neuro-plasticity, allowing for recovery of functioning. The brain can learn to compensate for damaged areas. Healthy areas “learn” to take on functions of damaged areas and new learning forms new pathways. Most rapid gains in recovery happen during the first 6 months following injury; recovery slows after 6 months with more modest gains likely until 2 years post injury. Two years is considered a milestone for recovery. However, gains may be experienced for years, but at a much slower pace. So with these points in mind, a child has the ability to recoup some level of executive functions through concentrated interventions and treatment. We used to think that plasticity ended with childhood, but we now know that it continues to some degree into later years of adulthood. There are many other points that could also be pertinent depending on the type of trauma you meant in the question. Please feel free to email me separately if you have other questions.
11. Q: What are your thoughts on research related to brain plasticity, such as the book the brain that changes itself? 

A: See answer above. The brain’s ability to compensate and “relearn” following injury is amazing!

12. Q: can inhibition be redefined and describe what it affects?

A: I often see executive functions described by the skills they affect rather than in an overarching taxonomy. Sometimes that description may limit our ability to generalize across several skills. For example, if I say a child is inattentive, he/she may also have difficulty inhibiting speech (maybe cursing). If we just describe inattention and disinhibited speech, we may miss the link, which is dyscontrol. I find that thinking about it as “control” is more accurate, because efficient executive functioning allows us to either inhibit or disinhibit.

13. Q: Where does the idea of emotional maturity fit in with executive functioning, and is EF proficiency gender-specific?

A: If you think of emotional development as having three stages (identification, regulation, and expression), then I think EF fits well into the regulation aspect. So if a child is dysregulated, it can affect their emotional development at regulation, which also compromises expression. I have seen children with flexibility issues not able to properly identify emotions, but most often the effects are most apparent at regulation.

14. Q: Would you please offer some interventional methods in order to developing inhibitory control?

A: I found Dawson and Guare’s book Executive Skills in Children and Adolescents to have many good recommendations for interventions.

15. Q: I often see average overall IQ scores on the WJ, with low fluency in academics in reading, math and writing on the WJ achievement test - perfect example of what you’re talking about....

A: Executive control is not often directly measured by standard ability tests, so that type of profile is common. Often you must separately measure EF to find the link between fluency deficits, which I suggest.

16. Q: How does anxiety interfere with EF in both children and adults and how do they differ, if at all?

A: Yes it does interfere. In children we tend to see more emotional dysregulation and in adults more disorganization, but that’s not a steadfast rule.
17. Q: Question: If a student has executive functioning difficulties will the difficulties be evident in all academic areas or can only one area be affected?

A: Not always, but most often that is the case. Even if the EF weaknesses don’t cause a significant problem in all academics, they likely impact learning in some way across academics. If a child has good cognitive resources and have a generally higher IQ, but with some executive weaknesses, academics they find more challenging may be more affected. So let’s say a child is a good reader, enjoys science, and writes well, but has difficulty with math in general, it’s more likely that the executive weaknesses will be most significant in math. However it may also show up in some other way, such as organizing a writing assignment.

18. Q: Effects of medication (Ritalin, Abilify, Depakote) on cognition?

A: We know that some medications do affect cognition. It’s often referred to as “dulling.” Although I have had a lot of experience working with children on medication that affected cognition, I am not an MD. The National Alliance on Mental Illness (NAMI) has some good references on their website that lists common psychotropics and their side effects.

http://www.nami.org/template.cfm?section=About_Medications

19. Q: Are you familiar with any of the computer based assessments available on-line (e.g., CNSVitalsigns)? They offer finger tapping, visual memory, stroop, etc. If so, what is opinion?

A: I have not used any of those specific assessments, so I can’t give you my opinion on their use. I’m also not sure if those tests were developed to be computer based or if they are the standard non-computer tests that were transferred to a computer platform. If the latter, I would ask to see the equivalency studies to make sure that a computer based test measures the same thing as the non-computer version. Changing platforms may affect the constructs measured. With that said, I have used some computer platform tests (CPT-II and WCST for example) and liked them.

Also, stay tuned to future news from Pearson regarding digital assessments. If you’ve attended any recent association conferences (such as APA) you may have seen developments in the areas of digital assessments coming from Pearson.

20. Q: Could you comment on right hemisphere deficits and attention/EF weaknesses? I am seeing this in students I test with NLD profiles and right-hemisphere subtype ADHD with slow processing speed and weaker attention but not especially weak working memory

A: I’ve seen some research implicating the right frontal and right parietal regions in ADHD, particularly with behavioral regulation and attention. So I think that may be related to what you’re seeing. Some research has found that
working memory, particularly verbal WM, largely functions on a pathway between left prefrontal and parietal regions.

21. Q: Is an educationally certified school psychologist able to administer the NEPSY-2? What training is needed?

A: Yes, NEPSY-2 is a C-level test. However, I would suggest practicing and getting some supervision prior to using it as the NEPSY-II is complex. Consider viewing one of Pearson’s free webinars online.

Here are the criteria for C-Level.

**Qual C:** Tests with a C qualification require a high level of expertise in test interpretation, and can be purchased by individuals with:

Licensure or certification to practice in your state in a field related to the purchase.

**OR**

A doctorate degree in psychology, education, or closely related field with formal training in the ethical administration, scoring, and interpretation of clinical assessments related to the intended use of the assessment.

22. Q: When an adult has questions about potential ADHD diagnosis, what are the best assessments to differentiate among the possible diagnoses?

A: In adults ADHD can cause impact across several different areas such as work, relationships, and home life. Also, long standing difficulties can lead to depression and anxiety. Therefore, when assessing ADHD in adults it is good practice to start with standardized tests of executive functioning and attention (D-KEFS, CPT, etc) to determine if the issues are significant, but also find out if there is functional impact through adaptive functioning and behavioral/emotional ratings.

23. Q: Where do time management deficits fit into the scheme?

A: I think of time management as executive control dependent. The ability to manage time requires some level of awareness of self and surroundings and thus comes after attention, but it is basically a divided attention task, which is secondary to attentional/cognitive control.

24. Q: What is your opinion on the use of the Wisconsin Card Sorting Test as a measure of executive function?

A: The WCST has a lot of research behind it verifying its validity with regard to frontal lobe dysfunction and its sensitivity to frontal lobe injury. I have used it as part of my battery, but mostly for head injury cases in a hospital or outpatient setting. I don’t find it particularly useful in a school setting because in schools I’m not diagnosing frontal lobe injury.
25. Q: Please comment on how to overcome resistance of learners to organization strategies, and ways to overcome it. Thanks.

A: It’s work! 😊 I’ve never found it easy to overcome disorganization, particularly in children who have other concomitant issues. First they have to recognize it’s a problem and then how the strategy can help them overcome that problem. I’ve had this barrier occur frequently in children with other psychiatric conditions that limit insight. Remember that a disorganized child is likely affected both behaviorally and cognitively. So, if a child can’t organize their notebook, then it’s also likely they have difficulty organizing their thinking.

The most effective way to overcome this barrier is to make its use a requirement (reward contingent maybe), and then spend a lot of time showing the student how tasks become easier when they use it. Also, kids who are disorganized tend to get into trouble more often when they lose paperwork, don’t have the proper items for class, etc. So you could show them that when they use an organization strategy they will naturally get into trouble less.

26. Q: What specific subtests of the NEPSY would you recommend as good measures?

A: The NEPSY-2 has an Attention/Executive Functions factor. There are several subtests, including Animal Sorting, Auditory Attention/Response Set, Inhibition, Clocks,

27. Q: Adam, what is your opinion about the gender differences that are found in EF development and how we should account for them?

A: Studies have found relatively few sex differences on measures of executive functioning. Davies & Rose (1999) found differences in executive functioning between males and females was related to some visual spatial tasks, but the differences depended on the type of visual spatial task administered. So by and large, it seems that both girls and boys develop executive functioning skills at similar rates. Look up Davies & Rose (1999) and Anderson (2002) for discussion about gender and EF.

28. Q: What is primary difference between Cogmed and Brain Train?

A: I don’t have enough information regarding Brain Train to comment. Please visit [www.cogmed.com](http://www.cogmed.com) for more information regarding Cogmed.

29. Q: I’d be interested in knowing how Cogmed compares with other EF interventions like Learning Rx.

A: Please visit [www.cogmed.com](http://www.cogmed.com) for more information.
Q: I understand that Cog Med has research support but do these gains truly translate into the classroom?

A: Yes, there is a large body of research regarding the benefits of Cogmed. Please visit [www.cogmed.com](http://www.cogmed.com) for more information regarding the research.

Q: Are there any published structured interventions for development of better EF skills?

A: I found Dawson and Guare’s book Executive Skills in Children and Adolescents to have many good recommendations for interventions.

Q: What resource do you like for finding actual interventions (external and internal) for EF weakness? I would particularly like something that lists them by deficit area that we might pull out in a team meeting when doing child study.

A: I’ve not seen published interventions that split external vs. internal, but that’s not to say it doesn’t exist. I have found it more useful to develop the interventions based on specific s/w profile. So I would suggest being as individualized as possible. However, the book Executive Skills in Children and Adolescents by Dawson and Guare has many good recommendations for interventions that you could adapt.

Q: How do you feel about the use of the IVA+plus CPT (Integrated Visual and Auditory Continuous Performance test) as an accurate read on diagnosing EF?

A: I have not used the Brain Train products, so I cannot comment on their use. However, I have used similar computer based attention measures, such as the CPT-II, and found them to be useful. I would have to first see the research behind the IVA+plus to help drive my decision if I was going to use it.

Q: Where was the resource that you showed for planning found?


Q: Which reference contained the goal plan predict do review form?

A: See above.

Q: As EF increases, does Grey matter increase or decrease?

A: On the slide you’re referencing you can see that grey matter increases steadily from age 5-21. Since there is also a developmental increase in EF during that time, you could see how they are tied together. However, it is also well known that EF becomes more efficient, as does learning, as our pathways become more efficient. So neuronal pruning also plays a part.
37. Q: I am a Speech Pathologist. I adopted a daughter with severe ADHD from Russia. I do all of the sequencing templates for tasks at home and even after 10 years, there is little to no carryover or initiation of the task. It is like she forgets the task should be done. Do you have any suggestions?

A: Generalization is one area that can be affected in kids with EF weaknesses, which affects carryover. Also, it sounds like you’re describing a child who may be stuck at the stage of using external structures and hasn’t yet had success internalizing those skills. One suggestion I have is for you and the school teams to use the exact same format across settings and across tasks. That tends to help with generalization. Also, as children pass developmental milestones into adolescence their ability to internalize skills often improves. Remember, EF interventions often take time and sometimes we must use external structures to guide our EF lifelong.

38. Q: How does the WJ-III Writing Samples require executive functioning skills?

A: I can’t give an answer for the WJ-III specifically, but writing samples in general require some level of organization and planning. The ability to write can definitely be limited by EF weaknesses, particularly with organization and transitioning between ideas, but also with careless errors in grammar, spelling, and punctuation.

39. Q: I have the Dawson, Guare book and use it quite a bit. Any other specific interventions or references that you recommend using with adolescents?

A: I have found the report print out from the BRIEF to have a good variety of interventions. Also, you may want to search references for cognitive rehab. With some modification, the treatment/interventions used in rehab are often transferrable to a school setting, and can be helpful even for non-brain injured students with EF dysfunction.

40. Q: what is the current research regarding medical intervention for improving EF in children and adolescents?

A: www.cogmed.com has some good references for WM interventions. With regard to medication, to my knowledge there has been little to show benefit to EF per se. Most medication research shows improvement in symptoms, but then requiring intervention/teaching of EF skills.

41. Q: You made a comment about the slowing of EF in adolescence and adulthood - if the original EF processes were not developed in the early years, will they continue to have deficits?

A: Yes, but with intervention you are often able to reach a functional level by adulthood. Often that can be limited by biology though, with TBI being an example.
42. Q: In working with high school students and considering executive functioning needs/intervention - would you begin with assessing for prior development/use of middle school expected skills? How would you go about intervening with students and adults given the myriad of challenges in a typical high school setting?

A: This is a challenging question, but one I’ve had a lot of experience with. High schoolers and adults often need to establish a goal before they accept the interventions necessary to reach that goal. So for example, if a student with EF difficulties has the goal of getting a job or going to college, then it is likely their path will be significantly more challenging without a clear plan. I’ve used that type of goal to establish a plan that includes interventions/accommodations to help them get there.

In terms of evaluation, I do think it’s a good idea to take a developmental approach to EF. “Higher order” skills won’t develop properly, or will be limited, if a person did not first develop the necessary primary skills.

43. Q: When you have kids with ADHD, they are considered by many to have maturity equal to roughly 2/3’s of their chronological age, so how does that impact the timeline for EF development?

A: Given that ADHD is primarily a disorder of executive dysfunction, you can assume that kids with ADHD will most often be behind typical peers with regard to EF development. I’m not sure about the 2/3 reference.

44. Q: In terms of the plan, how long should a strategy be implemented before you decide that it is not really effective and something new should be tried? (What’s rule of thumb?)

A: If you see some benefit (remember approximations to the goal), then keep going until that benefit stops or you find something more effective. Sometimes people will need to use external strategies lifelong, but only those that actually are beneficial.

45. Q: In order for interventions to be successful you would need student buy in. How do you get student buy in with students with fight or flight learning style? I have used Mary Ann Rafoth's book on Metacognition and the Student Styles Questionnaire as means to get older elementary students more invested in their learning. Any other suggestions?

A: Although I don’t believe it is the ultimate answer to this problem, a simple reward schedule that reinforces the use of strategies/accommodations is a good place to start. As long as a child is using the strategies you will get some gain. The difficult part is then transitioning them from extrinsic to intrinsic reward for the good job or ease of the task. I have found behavioral strategies effective with such an issue.
46. Q: Could you list three top book titles (vs. authors and references) on EF. Thanks!

A: That’s a hard one! It depends on what field you are interested in. I think it’s important to read a variety from neurology, neuropsychology, educational, as well as various disability specific sources. As I mentioned in the slides, the definition is evolving and I don’t believe there is one standard benchmark. However, starting with The Working Brain (Luria, 1973) and moving to Frontal Lobe Function and Dysfunction (Levin, Eisenberg, & Benton, 1991) is probably a good start.

47. Q: Will there be any talk on this topic for children ages 3 - 6?

A: There will be some elements of executive functioning addressed in the new WPPSI-IV revision. Please go here to view a brief overview of some of the upcoming changes to this revision:

https://www.brainshark.com/pearsonassessments/WPPSI4_Overview

48. Reference to the importance of "arousal" as necessary for good EF.

A: Posner & Peterson (1990) and Luria (1973) discuss importance of arousal.

49. Wouldn’t you add anxiety to Exec. Dysfx list of disorders?

A: Definitely, anxiety is affected by EF dysfunction and vice versa. Although there are some specifics regarding emotional disorders and EF dysfunction, I lump them together because most have a component of dysregulation. However, if you have a child who doesn’t have adequate concept formation, they may not be able to adequately identify emotions either.

50. Thank you. Good overview. Am familiar with all due to having a cognitive development center for 20 years and continuing to consult throughout the world for the last 6 years. We emphasized "meta-cognitive training", the "Internal" elements. These brought about the best results.

A: Internalization is the ultimate goal!

51. Good presentation. I would like to see more on working with adults with TBI and "MTBI" evaluation and rehab. Thanks.

A: A series on EF in adulthood will be presented by Drs Anne-Marie Kimbell and Amy Gabel coming up in February. Here is the link to register: