


**ADHD  
Parent Readiness  
Education Program  
(PREP)**

CADDAC  
416-637-8584  
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**ADHD and Learning**

- ▷ Academic Outcomes  
Classroom Presentations
- ▷ Executive Functioning
- ▷ Common Cognitive Impairments

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**ACADEMIC OUTCOMES**

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### Long Term Educational Outcomes

**Associated with poor academic outcomes even without coexisting Learning Disability**

ADHD versus Non-ADHD group

- ▷ Higher risk for lower levels of academic achievement
- ▷ 2 fold risk of grade retention
- ▷ 2 – 4 fold risk of Cs and Ds
- ▷ Reading and math scores 8 to 10 % lower
- ▷ More likelihood and more years in special education
- ▷ 3 fold risk of high school dropout
- ▷ Less likely to attend college and highest level completed 2 years less

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### Educational Underattainment

**OBJECTIVE:**

- ▷ This study evaluated subjects to determine whether the educational and occupational deficits associated with ADHD are what would be expected given their IQ.

**METHOD:**


- ▷ Participants derived from a case-control study of adults with and without DSM-IV ADHD. Subjects were assessed with diagnostic interviews and neuropsychological assessments. The expected educational and occupational levels of participants with ADHD were computed using ordered logistic regression models as a function of age, sex, and full scale IQ of controls. The study was conducted from 1998 to 2003.

**RESULTS:**

- ▷ Based on their IQ, subjects with ADHD were predicted to have significantly more education than they actually attained. Additionally, based on their observed education, participants with ADHD were predicted to have significantly higher occupational levels than actually observed.

**CONCLUSION:**

- ▷ These findings indicate that ADHD is associated with significant educational and occupational underattainments relative to what would have been expected on the basis of intellectual potential.

J Clin Psychiatry. 2008 Aug;69(8):1217-22. © CADDAC 2015 

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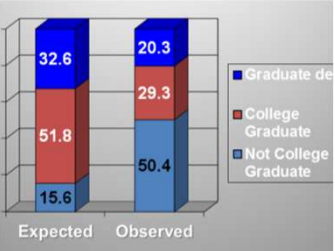
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### Expected versus Observed Educational Attainment Levels in Adults with ADHD



Category	Expected (%)	Observed (%)
Not College Graduate	15.6	50.4
College Graduate	51.8	29.3
Graduate degree	32.6	20.3

Modified from Biederman et al. (2008) J Clin Psychiatry 69:1217-1222 (Fig 1, p.1219)  
With permission of Dr. Rosemary Tannock

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### Additional Facts - ADHD and Learning

- ▶ **ADHD does not impact IQ**
- ▶ Classroom interventions focusing on decreasing disruptive behaviour and improving on task behaviour does not result in better learning or better academic outcomes
- ▶ Inattention, not hyperactivity or impulsivity during elementary years predicts long term poor academic outcomes
- ▶ Specific interventions targeting learning deficits and accommodating and improving cognitive difficulties need to be implemented
- ▶ Fine and gross motor impairments may impair activities

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## CLASSROOM PRESENTATIONS

ADHD Symptoms in the Classroom

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### The Classroom Environment

It is difficult to imagine a more difficult setting for a child with ADHD than the classroom, They must:

- ▶ Sit still for long periods of time and stay quiet
- ▶ They must listen and comprehend continuous lists of instructions
- ▶ They must follow lists of multiple directions
- ▶ They must work independently and be productive
- ▶ They must self regulate their behaviour and regulate their emotions to be able to interact appropriately with their classmates and teachers

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### ADHD in the Classroom

**General Impairments Seen in Academic settings:**

- ▷ More frequent off-task behavior
- ▷ Work less accurate and less work produced
- ▷ Interfere with classmates more often
- ▷ Disobey class rules more frequently
- ▷ Less likely to obey teachers' requests & demands

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### TeachADHD Table 1-1: Manifestation of ADHD Symptoms in the Classroom

- ▷ The inability to regulate attention is what causes learning impairment
- ▷ The hyperactive and impulsive symptoms are what other find annoying, but do not the symptoms that generally impair learning

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### Presentation of Attention Issues

- ▷ Inability to regulate attention causes learning impairment
- ▷ Easily distracted, pulled away from tasks
- ▷ Does not listen when spoken to
- ▷ Starts assignment but cannot remain focused to complete
- ▷ Cannot follow instructions
- ▷ Difficulty remembering routines and organizing tasks
- ▷ Rushes through work, difficulty with attention to detail – frequent mistakes
- ▷ Difficulty keeping track of belonging
- ▷ Difficulty starting tasks especially if challenging
- ▷ Day dreamy

TeachADHD Table 1-1: Manifestation of ADHD Symptoms in the Classroom  
Tannock, R., Hum, M., Masellis, M., et al. (2000). Teacher Telephone Interview  
Basic Training Manual © 2000. Toronto: Unpublished Manuscript, The Hospital for  
Sick Children, Department of Psychiatry, Toronto, Canada

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- CADDAC, 2013, Paying Attention to the Cost of ADHD... The Price Paid by Canadian Families, Governments and Society, web site CADDAC and ADHDawareness.ca

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## ADHD AND LEARNING: EXECUTIVE FUNCTIONING AND COGNITIVE IMPAIRMENTS

Executive Functioning  
Cognitive Impairments

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## ADHD and Executive Functioning

- ▷ ADHD is often accompanied by an impairment or weakness in Executive Functioning (EF)
- ▷ If so, the child is at greater academic risk
- ▷ Executive Functioning weakness/impairment has significant impact on overall functioning
- ▷ Executive Function processes are used to **control** and integrate self management (**behaviour**)
- ▷ EF impacts both Literacy and Numeracy
- ▷ EF also impacts social skills and emotional regulation

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### What is Executive Functioning?

- ▶ EF skills include: the ability to control attention and resist distraction, regulate emotions, self evaluate, organize, plan, problem solve, use hindsight and forethought, and working memory.

**Ways to understand EF**

- ▶ Dr. Thomas Brown – EF the CEO or conductor of the brain - [www.drthomasebrown.com](http://www.drthomasebrown.com)
- ▶ Can be thought of as a more “Hidden Learning Disability” as it impacts all subjects
- ▶ Demand on EF becomes greater as the child ages

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### Executive Functioning Impairment

**Active Working Memory (WM)**

- ▶ Where information is stored and manipulated for only seconds
- ▶ Not short term memory where info is stored and retrieved
- ▶ WM associated with success in both literacy and numeracy
- ▶ WM impacts reading comprehension and written expression
- ▶ WM used to control attention and resist distraction
- ▶ WM helps us to stay on task and remember our end goal – those with ADHD lose their goal

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### Executive Functioning Impairment

**Active Working Memory (WM) Continued...**

**Ways to understand WM**

- ▶ The ability to hold and juggle numerous open files in the mind
- ▶ Visualize the mind as having computer files
- ▶ Consider how many files you need open to write a paragraph
- ▶ Even moderate impairment impacts self-regulation of behaviour
- ▶ How many files does a child need open to weigh the pros and cons of a behaviour?

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### Executive Functioning Impairment

**Impaired Planning and Problem Solving**

- ▷ Limited Hindsight and Foresight
- ▷ Inability to use experiences to interpret outcomes
- ▷ Difficulty reviewing options for the future
- ▷ Poor flexibility when circumstances change
- ▷ Difficulty following rules and instructions and comprehending what they hear and read

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### EF Impairments Continued

**Poor Organization Abilities**

- ▷ Impaired sense of time and poor time management
- ▷ Frequently over or under estimate time required
- ▷ Overwhelmed with large assignments and great difficulty in breaking assignments down
- ▷ Poor execution – beginning the task
- ▷ Need frequent continuous reminders of routines, rules, instructions and sequences
- ▷ Will fail without organizational supports

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### EF Impairments Continued

**Listening and Reading Comprehension Impairment**

- ▷ Difficulty following a sequence of verbal instructions
- ▷ Material may need to be read and reread
- ▷ Reading at upper grade levels repetitive, frustrating and time consuming

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**Cognitive Impairments**  
**Commonly Seen in Students With ADHD**  
**in the Classroom**

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**Common Cognitive Impairments**

- ▶ Miss signals / slower reaction time
- ▶ Reduced sensitivity to errors
- ▶ Difficulty becoming motivated and sustaining motivation to tasks
- ▶ Tire easily cognitively
- ▶ Live in the "NOW"
- ▶ Long term goals lose their significance
- ▶ Easier to discount future rewards

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**More Cognitive Deficits**

**Language Expression**

- ▶ One of the most impairing symptoms
- ▶ Modulating voice, speaking at an appropriate level – immature motor system
- ▶ Blurting out answers or questions
- ▶ Talking excessively
- ▶ Interrupting others

**Additional Language Difficulties**

- ▶ Comprehension, expression, vocabulary, grammar and syntax
- ▶ Will impact school work, communicating ideas, and social interaction - will require assistance

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### More Cognitive Deficits

**Difficulty with Cognitive Shifting**

- ▷ Become frustrated and reactionary when asked to shift cognitive focus
- ▷ Resulting in difficulty with transitions

**Internalized Speech**

- ▷ 30 to 40% behind in internalization of speech
- ▷ Underdeveloped self talk results in less well thought out choices and reactions

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### More Cognitive Deficits

**Processing Speed**

- ▷ Defined as the rate that incoming and outgoing information can be processed
- ▷ Children with ADHD are frequently slow or variable in processing
- ▷ This can impact the time it takes to process information and instructions, retrieve information, answer questions, copy things from the board and complete work
- ▷ Students with ADHD may not be able to keep up with the rest of the class if speed is not adjusted

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### How EF Weaknesses May Manifest in the Classroom

**Children may have difficulty with:**

- ▷ Identifying the problem, knowing what the finished product of a task should look like
- ▷ Planning, executing, and monitoring projects or assignments (organization, chunking work time management)
- ▷ Holding directions in mind, especially if the directions are complex or multi-step
- ▷ Multi-tasking (trying to organize and complete several tasks within a specific time frame)
- ▷ Resisting or delaying impulses (for example, tendency to blurt out answers rather than resisting the impulse and putting up hand)

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### How EF Weaknesses May Manifest in the Classroom (continued)

- ▶ Children may have difficulty with: getting started on assignments (that is, difficulty with initiation) despite interest in the work
- ▶ Setting goals and carrying out steps to achieve goals
- ▶ Monitoring school work (for example, checking for errors)
- ▶ Monitoring how their actions affect others in a social context

From: Tannock, R., Hum, M., Masellis, M., et al. (2000). Teacher Telephone Interview Basic Training Manual © 2000. Toronto: Unpublished Manuscript, The Hospital for Sick Children, Department of Psychiatry, Toronto, Canada – Section Rethinking ADHD from a Cognitive Perspective

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### Educational Implications of Executive Function Weaknesses

- ▶ Children may require direct instruction, coaching or supports to be able to, plan and monitor school assignments, set goals and evaluate progress – do not learn skills through osmosis as other students do
- ▶ Tasks should be analyzed for number of steps, newness and complexity and skills required to understand where students may need support
- ▶ Executive function weaknesses may be present even though the student does well on standardized tests and exhibits good ability

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### Educational Implications of EF Weaknesses Continued

- ▶ Executive function difficulties should not be considered to reflect laziness or unmotivated behaviour on the part of the student
- ▶ EF weaknesses may hinder the student in performing new/or complex tasks independently
- ▶ Instruction that helps student learn "how to learn" can help them perform complex academic tasks (for example, reading comprehension, written composition)

From: Tannock, R., Hum, M., Masellis, M., et al. (2000). Teacher Telephone Interview Basic Training Manual © 2000. Toronto: Unpublished Manuscript, The Hospital for Sick Children, Department of Psychiatry, Toronto, Canada – Section Rethinking ADHD from a Cognitive Perspective

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### How Executive Function Weaknesses May Manifest in the Classroom

- ▶ Review Dr. Rosemary Tannock's "How Executive Function Weaknesses May Manifest in the Classroom"
- ▶ Review Behavioural side of the CADDAC classroom accommodations chart
- ▶ Can you identify specific impairments that your child or student may be experiencing?
- ▶ Are there specific tasks they are struggling to complete?
- ▶ What are the education implications that you think you as a parents or teacher should be aware of?

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### The EF Impairment Profile

- ▶ It is essential to understand a child's executive functioning strengths and weaknesses along with their ADHD symptoms
- ▶ This will allow for the development of a learning profile
- ▶ Once weaknesses are identified strategies can be put in place to support and teach skills
- ▶ Medication does not teach these skills
- ▶ Access CADDAC's Classroom Accommodations for Specific Behaviour to assist with the identification of areas of need
- ▶ Psychoed testing may also be beneficial

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