

Effective Parenting



April/May 2018
Tuesday Evening Seminars
May 1st Location = Stewart Bio S1-3
1205 Dr Penfield Ave

Slides Available Thursday: bit.ly/mcgillparent



April 3 Helping your child manage stress in a complex world
Drs. Nancy Heath & Amy Shapiro



April 10 Improving sleep: A guaranteed method for improving school achievement and behaviour for children (and their parents)
Dr. Steven Shaw



April 17 Helping your child navigate and learn online in a time of Facebook and fake news
Dr. Adam Dubé



April 24 Introduction to gender, sex and sexuality: What to know to help your kids
Dr. Jessica Ruglis



May 1 Understanding neurodevelopmental conditions: What parents need to know
Dr. Armondo Bertone

Understanding neurodevelopmental conditions : What parents need to know

Armando Bertone, PhD

armando.bertone@mcgill.ca

**Perceptual Neuroscience Laboratory
(PNLab.ca) for Autism and Development**



**School/Applied Child Psychology & Human Development
Department of Educational and Counselling Psychology**



neurodevelopment – very complex, dynamic process ...

during development ...

neural tube becomes brain and spinal cord (CNS)

100 billion neurons synapse at different locations in brain and SC

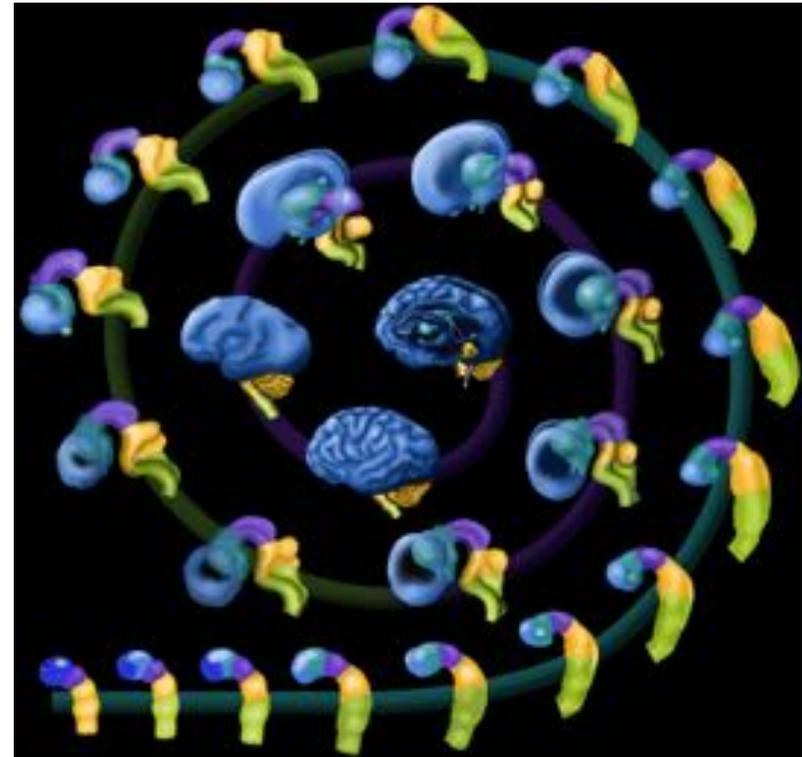
each make connections to ≈ 1000 target cells

at birth, the human brain ≈ 350 grams.

- year 1 ≈ 1000 grams.
- adult brain $\approx 1200-1400$ grams.

different, sequential processes during cortical development :

- cellular differentiation
- axonal growth
- myelination
- **synaptogenesis** - formation of synapses between neurons



stage of cortical development : nature vs nurture

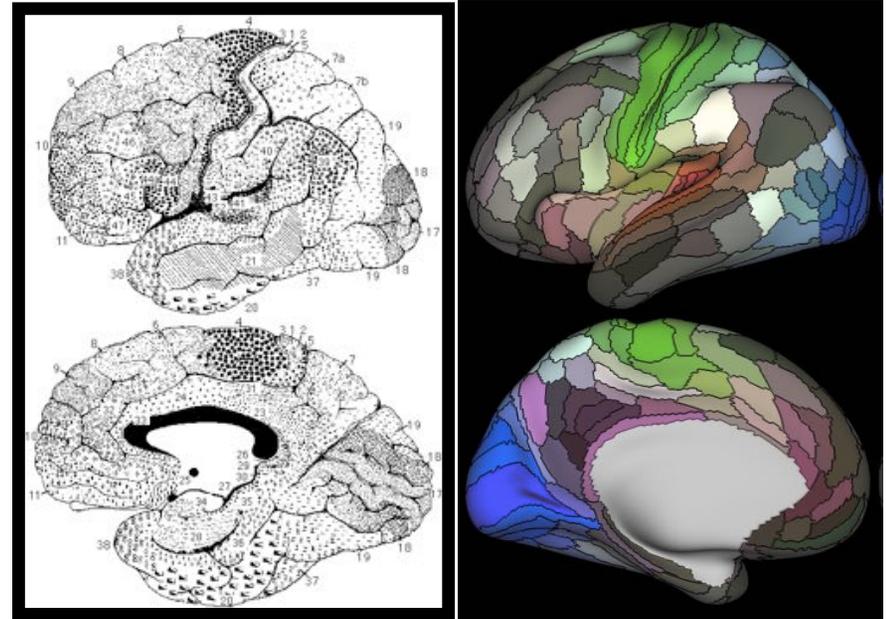
structure of the brain : product of **sculpting** as much as **growth**

Synaptic exuberance and pruning - after birth, synaptic density increases dramatically but this also differs by region

- experience **expectant** dev't : **pre-determined** growth (typical critical periods)
- experience **dependent** dev't : **experience** as sculptor

critical periods of development - starting with vision, hearing and touch, periods for language and higher cognition occurring later

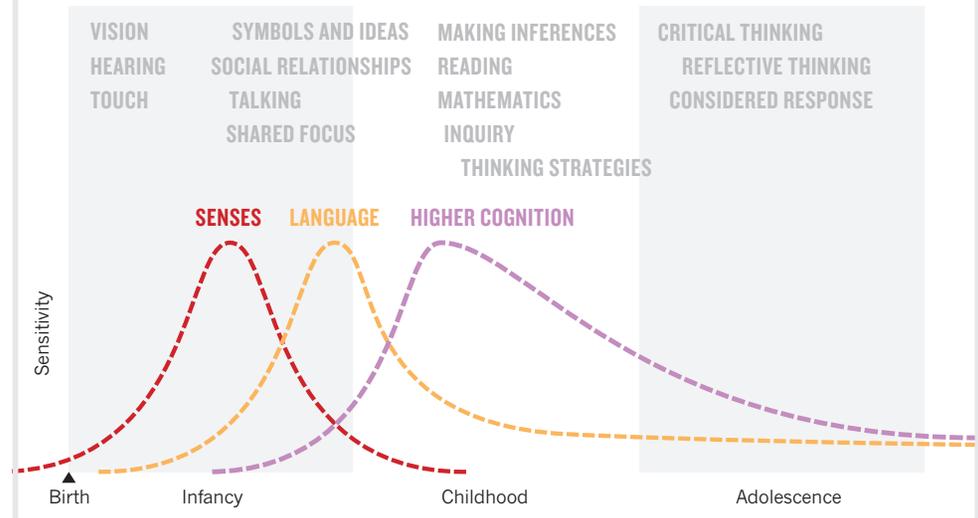
- associated with cognition and behaviour



Glasser et al 2015

OPEN AND SHUT

The human brain's sensitivity to learning seems to crest in three broad waves. The critical periods for cortical regions devoted to vision and other senses (red) open in infancy, then close tightly. Those for language (yellow) and higher cognition (purple) open later, and never close entirely. The successive waves allow a child to acquire increasingly complex skills (grey text).



What are Neurodevelopmental Disorders (NDs)?

- a group of conditions **with onset** in the **developmental period**.
- typically **manifest early in development** (before the child enters grade school)
- characterized by developmental deficits that produce **impairments of personal, social, academic, and/or occupational functioning**.
- challenges vary from the **very specific** (i.e., learning math, difficulty with attention, etc.) to **more global** (i.e., social skills or intelligence).
- frequently **co-occur**
- **not a ND** when a child is temporarily delayed in one or more milestones, then catches up to peers or "normal" range

DSM 5 : Neurodevelopmental Disorders (NDs)

Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) : the standard classification and codes of mental disorders used by mental health professionals in the United States.

Intellectual Disabilities

Communication Disorders

Autism Spectrum Disorder

Attention-Deficit/Hyperactivity Disorder

Specific Learning Disorder

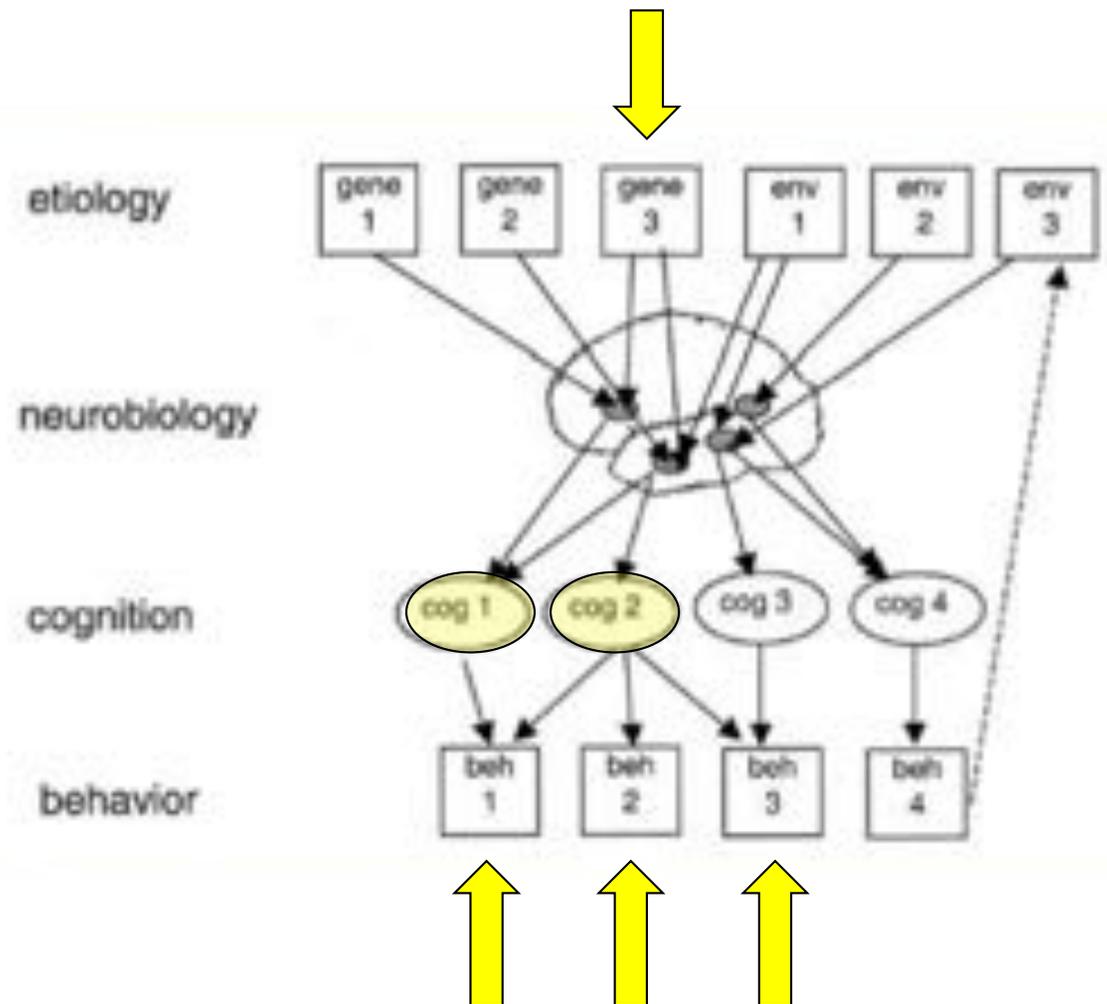
Motor Disorders

Other Neurodevelopmental Disorders



Common characteristics of (NDs)

- often defined in **terms of behaviour**, not **cause**
- no **single** biological cause
- **male preponderance** in most cases
- tend to **run in families**
- **co-morbidity** is the often prevalent ...
- **gene x environment** interactions



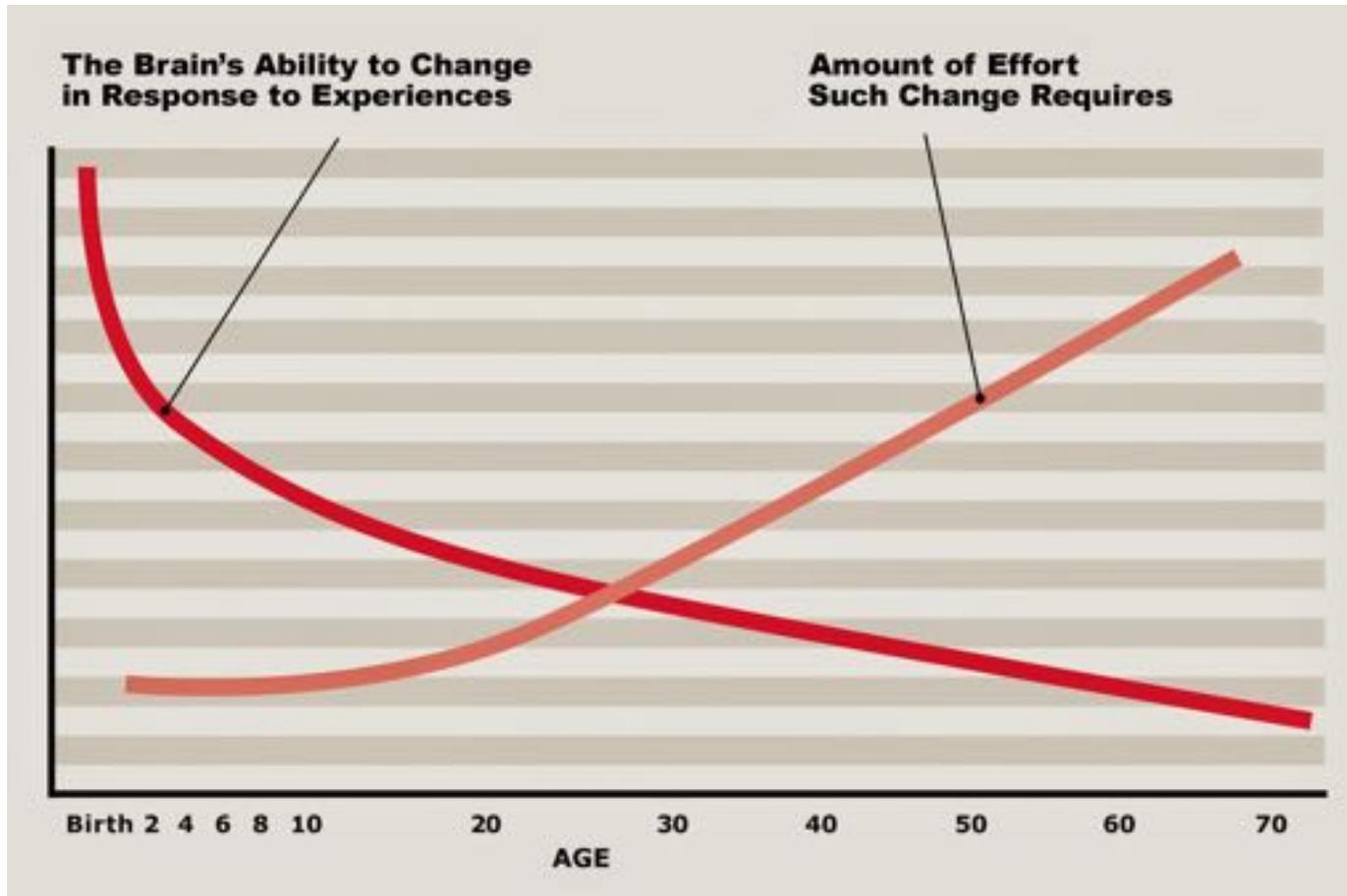
Neurodevelopmental Disorders (NDs)

- NDs with **known** prenatal cause of **genetic** or **acquired** origin : Down Syndrome, fetal alcohol syndrome, etc.
- NDs where atypical neurodevelopment is **inferred** : exact cause is complex or even unknown (most of them ...) & defined in terms of **behaviour** that is observed ...



Early intervention

- **Early** assessment = **Early** intervention = **best** outcomes (critical periods)
- It is easier and less costly to form strong brain circuits during the early years than it is to intervene or “fix” them later = **cortical plasticity** ...



Specific Learning Disorders

dyslexia (reading disorder)

dyslexia in adults was first noted in the latter half of the 19th century

developmental dyslexia in children was first reported in 1896.

dyslexic patients - seen by ophthalmologists, called the disorder “**word blindness.**”

James **Hinshelwood**, a Scottish **ophthalmologist** - dyslexic children were often **exceptionally smart** except for their **inability to read**

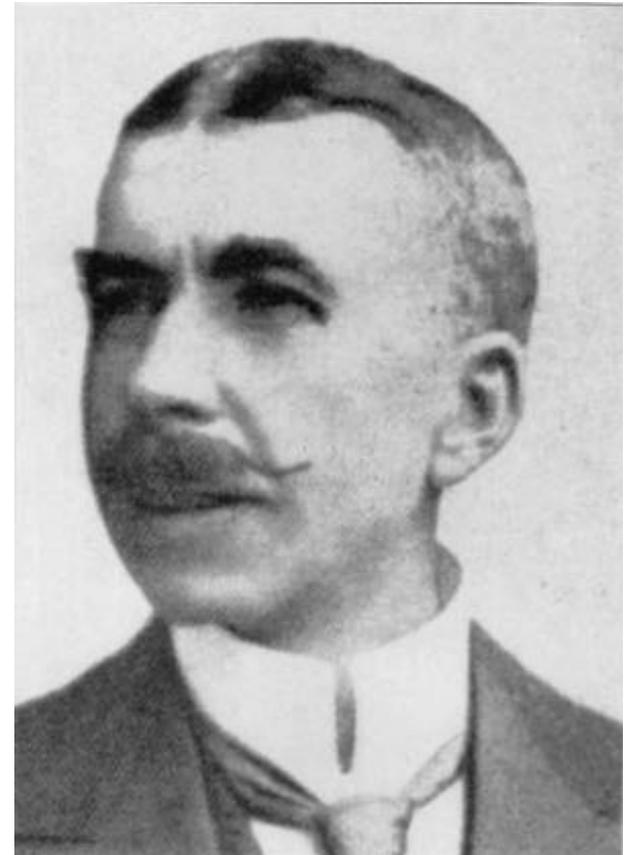


FIG 1. James Hinshelwood, a pioneering Scottish ophthalmologist who was the one of the first physicians to describe the clinical picture of dyslexia as well as to promise a coherent plan of management.

Specific Learning Disorder (SLD) (DSM-V) \approx *dyslexia*

DSM-IV (315.00) Diagnostic Criteria

Specific Learning Disorder (SLD)

- A. difficulty **learning / using academic skills**, as evidenced by presence of at least **one** of following for **6 months**, despite intervention ..
1. inaccurate or slow and effortful **reading**
 2. difficulty understanding **meanings of words**
 3. difficulty w **spelling**
 4. difficulties w **written expression**
 5. difficulties mastering **number sense, number facts, or calculations**
 6. difficulties w **mathematical reasoning**
- B. **affected academic skills** below expected chron. age & cause sig interference w academic or occupational functioning (confirmed using standardized cognitive tests).
- C. **learning difficulties** - fully manifested when demands for affected academic skills **exceed individual's limited** capacity (excessively **heavy academic load**)
- D. learning difficulties **not** better **accounted** for by **intellectual delay, visual/auditory problems, educational instruction, psychosocial adversity**, etc.



specify if :

- with **impairment in reading** (*dyslexia*), written **expression** (*dysgraphia*) and/or **mathematics** (*dyscalculia*)

SLD w impairment in reading \approx *dyslexia*

dyslexia accounts for **80% of all cases of learning disorder** (alone or in comb with disorders in written expression or mathematics)

in 2006, a “limitation related to learning” affected 121,080 children aged 5 to 14, or **3.2% of all children in Canada** (includes ADHD)

60-80% of individuals diagnosed with reading disorder are male

- **2:1 to 3:1** more males - genetics?
 - is **strongly** (54 to 75%) **heritable**, occurring in up to **68% of identical twins** and **50% of individuals** who have a **parent** or **sibling** with dyslexia
- may, however, be **confounded** with a **higher incidence of disruptive behavior in males** (often accompanied by ADHD)

symptoms - inability to distinguish among **common letters** or to associate common **phonemes with letter symbols** - may occur as early as kindergarten.

usual diagnosis after 1st grade - but, may not be apparent until the **3rd, 4th grade** (or later).

SLD w impairment in reading (dyslexia): symptomology

complaints center around **poor school performance**.

general **ontogeny** - **delay in speaking**, did not learn letters by **kindergarten**, and did not begin to **read by 1st grade**.

child **progressively falls behind**

dysgraphia is often **present** - laborious note taking

self-esteem is frequently affected (even in adulthood)

negative test-taking experiences

given **sufficient time**, individuals w *dyslexia* score well on tests of **reading comprehension**.

TABLE 1. Clues To Dyslexia In School-Age Children*

History

Delayed language

Problems with the sounds of words (trouble rhyming words, confusing words that sound alike)

Expressive language difficulties (mispronunciations, hesitations, word-finding difficulties)

Difficulty naming (difficulty learning letters of alphabet and names of numbers)

Difficulty learning to associate sounds with letters

History of reading and spelling difficulties in parents and siblings

Reading

Difficulty decoding single words

Particular difficulty reading nonsense or unfamiliar words

Inaccurate and labored oral reading

Slow reading

Comprehension often superior to isolated decoding skills

Poor spelling

Language

Relatively poor performance on tests of word retrieval (name the pictured item)

Relatively superior performance on tests of word recognition (point to the pictured item)

Poor performance on tests of phonological awareness

Clues most specific to young children at-risk for dyslexia

Difficulty on tests assessing: knowledge of the names of letters, the ability to associate sounds with letters, and phonological awareness

Clues most specific to bright young adults with dyslexia

Childhood history of reading and spelling difficulties

Accurate but not automatic reading

Very slow performance on timed reading tests (eg, Nelson-Denny Reading Test)

Penalized by multiple choice tests

SLD w impairment in reading (dyslexia) : diagnosis assessment

skills need to read and spell are affected
at **school entry**

oral reading is characterized by
distortions, substitutions, and/or omissions

both oral and silent reading are
characterized by **slowness** and **errors in comprehension**.

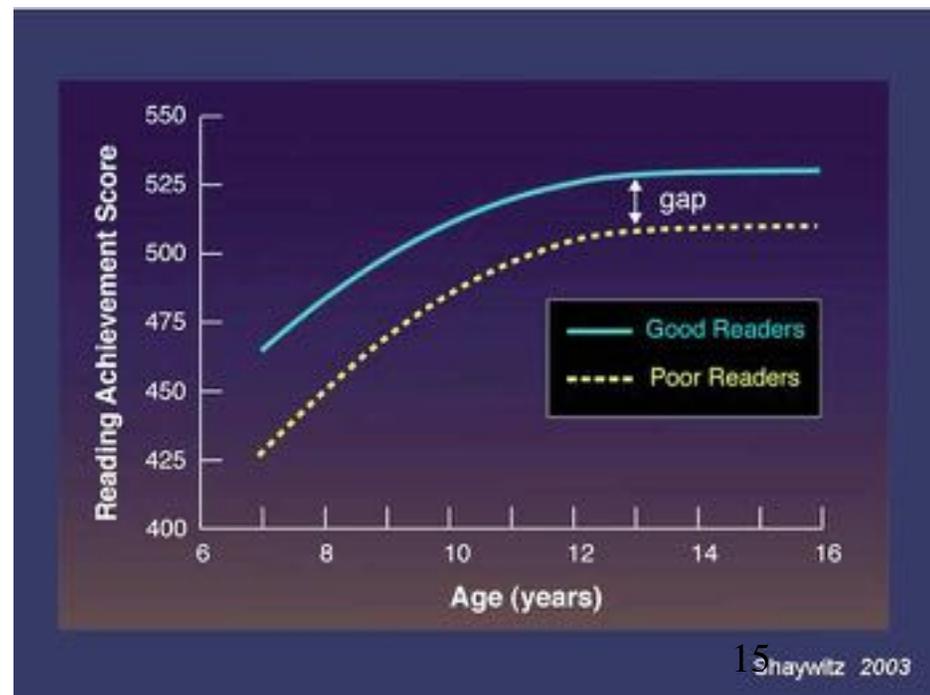
dyslexia is a **persistent**, chronic condition;
it **does not** represent a **transient**
“developmental lag” = Fig

average or above average Intelligence

TABLE 2. Types of Tests Useful in Identifying Children At Risk for Dyslexia at School Entry

Letter identification (naming letters of the alphabet)
Letter—sound association (eg, identifying words beginning with the same letter from a list: doll, dog, boat)
Phonological awareness (eg, identifying word that would remain if a particular sound were removed: if the /k/ sound was taken away from “cat”)
Verbal memory (eg, recalling a sentence or a story that was just told)
Rapid naming (rapidly naming a continuous series of familiar objects, digits, letters, or colors)
Expressive vocabulary or word retrieval (eg, naming single-pictured objects)

Reprinted with permission.



Woodcock et al 1989.

development of phonological awareness (Berg & Stegeman, 2003)

phonological awareness : a skill development follows a predictable developmental

Typical Age of Mastery Skill

- **3 years** : recite **rhymes**, rhyme by pattern, **alliteration** (cat, core)
- **4 years** of age : **count syllables** (50% of children)
- **5 years of age** : count **syllables** (90%); count **phonemes** (<50%)
- **6 years** : match **initial consonants**; blend **2 to 3 phonemes**; **count phonemes** (70%); identify rhymes; divide onset-rimes (e.g., c-at)
- **7 years** : blend **3 phonemes**, segment 3 to 4 phonemes, **spell phonetically**, **delete phonemes**

GENERALLY : develop from from **phonemic (sounding out)** towards **lexical (automatic) process ...**

can asses using cognitive testing

examples : phonological awareness assessment task (Cassady et al 2005)

phoneme : the smallest unit of speech that can be used to make one word **different** from **another** word.

Table 1. *Phonological Awareness Assessment Task Examples*

Phonological Awareness Task	Basic Instructions	Sample Item(s)
Rhyme recognition	Rhymes are words that sound the same at the end... Tell me if these words rhyme.	ape-knee; dip-hip
Rhyme application	Tell me a word that rhymes with:	cap
Oddity tasks: Beginning sounds	Listen to the names of these pictures. Tell me which one has a different beginning sound.	nest, soap, nails
Oddity tasks: Ending sounds	Listen to the names of these pictures. Tell me which one has a different ending sound.	bell, web, crib
Oddity tasks: Middle sounds	Listen to the names of these pictures. Tell me which one has a different middle sound.	beak, cone, heel
Blending body-codas	I will say two parts of a word separately. You tell me the word.	/co/ /p/
Blending onset-rimes	I will say the first sound of a word and then the rest of the word separately. Tell me the whole word	/c/ /op/
Blending phonemes	I'm going to say each sound of a word slowly, then you tell me the word.	/s/ /a/ /ve/ -- "what is the word put together?"
Segmenting onset-rimes	Split the word by saying the first sound and then the rest of the word:	"Split the word coat by saying just the first sound and then the rest of the word.
Segmenting phonemes	Say each sound you hear in the word	job
Phoneme deletion	Listen to the word _____. Take away the first sound, what is left?	Listen to the word book . Take away the /b/ sound, what is left?
Phoneme Substitution: Beginning sounds	If I change the first sound in the word man to /p/ , the new word is pan .	Change the first sound in cat to /h/ . What is the new word?
Phoneme Substitution: Ending sounds	If I say the word rat and change the last sound to /g/ , the new word is rag .	Change the last sound in cat to /p/ . What is the new word?
Phoneme Substitution: Middle sounds	If I say the word pan , change the middle sound to /i/ , the new word is pin .	Change the middle sound in the word cat to /o/ , what's the new word? 17

Note: The phonological awareness task examples are based on the structure of the SAPA. There are variations across measures on the instructions, types of items, and number of tasks assessed.

SLD w impairment in mathematics (dyscalculia) : symptomology

dyscalculia : difficulty performing **math calculations** or **learning** disability which affects math

- **number-specific** cognitive challenge - number concepts, combinations, and resolving word problems
- not caused by other cognitive difficulties (i.e., attention)

young children : difficulty w

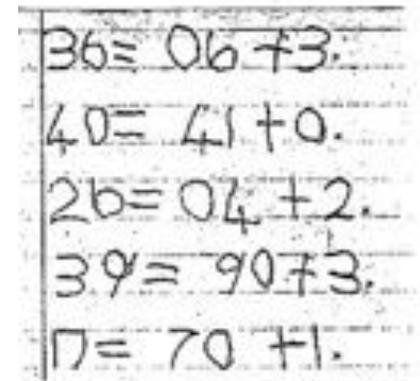
- **counting**, trouble **recognizing** printed **numbers**, difficulty tying together the **idea number** (4) and how it exists in the world (**4 cars**), poor **memory** for numbers

school-age children : difficulty w

- learning **math facts**, developing **math problem-solving** skills, **long term memory** for **math functions**, **measuring** things, etc.

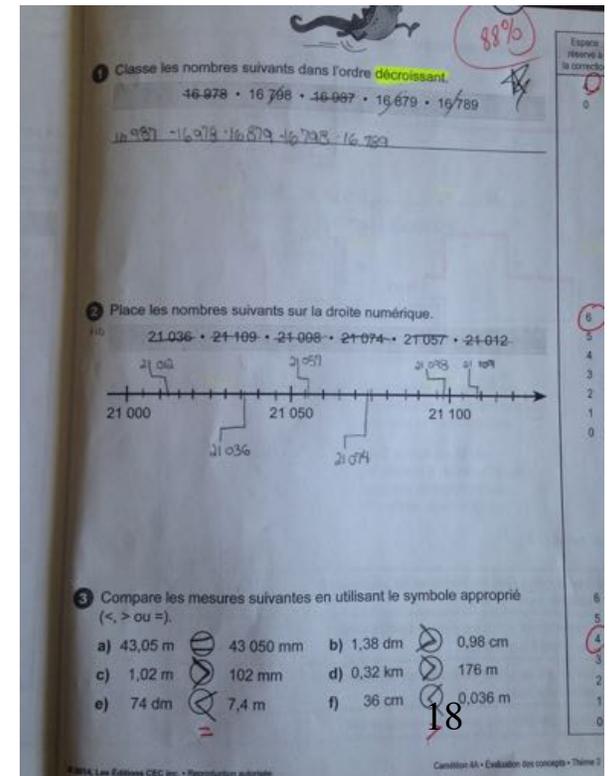
teenagers/adults : difficulty w

- **estimating costs** (i.e., groceries bills)
- **budgeting** or **balance a checkbook**,
- **concepts** of time (schedule, etc.)



Handwritten math problems on lined paper showing errors in calculation:

- $36 = 06 + 3$
- $40 = 41 + 0$
- $26 = 04 + 2$
- $39 = 90 + 3$
- $17 = 70 + 1$



A photograph of a math worksheet with handwritten answers and a score of 88%. The worksheet contains three questions:

1. Classe les nombres suivants dans l'ordre décroissant.
46 978 • 16 798 • 16 997 • 16 679 • 16 789
16 997 • 16 978 • 16 679 • 16 789 • 16 798

2. Place les nombres suivants sur la droite numérique.
21 036 • 21 109 • 21 098 • 21 074 • 21 057 • 21 042
A number line from 21 000 to 21 100 is shown with points marked at 21 036, 21 057, 21 074, 21 098, and 21 109.

3. Compare les mesures suivantes en utilisant le symbole approprié (<, > ou =).
a) 43,05 m 43 050 mm b) 1,38 dm 0,98 cm
c) 1,02 m 102 mm d) 0,32 km 176 m
e) 74 dm 7,4 m f) 36 cm 0,036 m

The score 88% is circled in red. A red checkmark is next to question 1. A red circle with the number 5 is next to question 2. A red circle with the number 4 is next to question 3. A red checkmark is next to question 3.

adults with SLD

Many adults have grown up feeling **inadequate**, attributing their difficulties to a **general lack of ability**.

- **knowing** that there is a **specific reason** for their difficulties can be a **great relief**.
- better understanding of their **strengths** as well as their **weaknesses** = important step towards building **self-esteem** and **developing** more **effective coping strategies**.

Many adults newly diagnosed with SLD could benefit from **counselling**

- **personal** - understand their **strengths** and **weaknesses** - **self-esteem**
- **professional** - **career** / adult support groups may be helpful

Many **excellent support programs** for the student / adults w SLD in colleges / universities

- useful for students **to self-identify** in order to **access services** and **accommodations**.

<https://ldaamerica.org>

- how to manage social-emotional issues of adults with SLDs

interventions : school

Individualized Education Program (IEP) : is a written plan that describes the modification of level of instruction or adaptations to the curriculum required by a particular student.

modifications : changes to WHAT is taught & assessed

- meet **student needs** that are **substantially different** from the **prescribed grade level curriculum**.
- Learn **different material** (such as continuing to work on multiplication while classmates move on to fractions)
- Get **graded** or **assessed** using a **different standard** than the one for classmates
- Be **excused** from particular projects
- alter the grade-level learning expectations (for a subject or course) from the **provincial curriculum**

accommodations : changes to HOW child is taught and assessed

- can be **environmental, physical, academic, organizational, motivational, assessment & evaluation**
 - amount of work, time to complete in-class work, level of support (professionals) , difficulty (problem type), output (# of words for composition), alternate expectations

interventions : home / parents

maintain **realistic expectations** about learning skills.

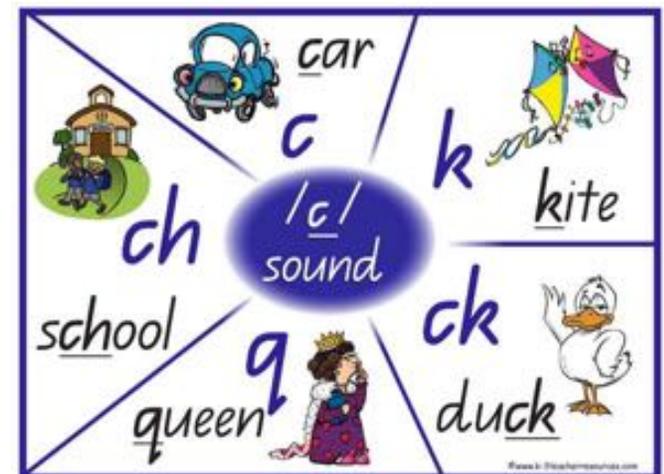
- challenges does not mean that child will **always** make reading errors, but more **laborious** compared to child's peers
- reading a few pages / night – just practicing is a **short-term, tangible** goal

celebrate every **success** (ie., with a "good job" or "a high five")

- reward **progress** and **effort**.
- work of self-esteem !!!

phonetic awareness / spelling will continue to be a **challenge** for a child

- provide a **visual phoneme chart** to help with homework - helpful to pair the sounds with relevant images.
- use **dictionary, spell check, or text-prediction** software
- **read aloud** w child or use **App** that reads aloud so child can gain **understanding context/meaning** of text, help with **phonetic awareness & comprehension**



resources

Montreal Centre for Learning Disabilities

<http://www.ldmontreal.ca>

- charitable organization that aims to disseminate information, promote awareness and provide innovative services and programs to the English speaking community
- adult services



Montreal Fluency Centre

<http://montrealfluency.com>

- specialized after-school programming that targets phonological skill development.



L'Institut des troubles d'apprentissage

<http://institutta.com>

- non-profit organization catering to persons with SLDs and their families.



ADHD

history

Early 1900s - ADHD was first mentioned in 1902 by **British pediatrician Sir George Still**

Children who lacked self-control and showed symptoms of overactivity / inattention in school were said to have “**defective moral control**”, but were intelligent

1900 - 1950 : Minimal Brain Dysfunction (damage):

1950 -1969 : Hyperkinetic/Hyperactivity Syndrome (DSM-II of 1968)

1970 – 1979 : Recognition of Attentional impairment and Impulsivity

1980 : Diagnostic Criteria (DSM-III) and “ADD” with or without Hyperactivity

1987 : ADD becomes ADHD (DSM-IIIR) w/mixed criteria:

1994 : ADHD (inattentive, hyperactive, combined subtypes) in DSM-IV

THE LANCET, APRIL 19, 1902.

The Goulstonian Lectures

ON

**SOME ABNORMAL PSYCHICAL CONDITIONS
IN CHILDREN.**

*Delivered before the Royal College of Physicians of
London on March 4th, 6th, and 11th, 1902,*

**BY GEORGE F. STILL, M.A., M.D. CANTAB.,
F.R.C.P. LOND.,**

ASSISTANT PHYSICIAN FOR DISEASES OF CHILDREN, KING'S
COLLEGE HOSPITAL, ASSISTANT PHYSICIAN TO THE
HOSPITAL FOR SICK CHILDREN, GREAT
ORMOND-STREET.

LECTURE II.

Delivered on March 6th.

MR. PRESIDENT AND GENTLEMEN.—In my first lecture I drew your attention to some points in the psychology and development of moral control in the normal child and then considered the occurrence of defective moral control in association with general impairment of intellect; before going further it may be well to review briefly the points which have been raised. Moral control, we saw, is dependent upon three psychical factors, a cognitive relation to environment, moral consciousness, and volition, which in this connexion might be regarded as inhibitory volition. Moral control, therefore, is not present at birth, but under normal psychical conditions is gradually developed as the child grows older. The variation in the degree of moral control which is shown by different children at the same age and under apparently similar conditions of training and environment suggested that the innate capacity for the development of such control might also vary in different individuals.

core characteristics of ADHD

Key symptoms fall under **two well-documented categories**

- **Inattention**
- **Hyperactivity-impulsivity**

Using these dimensions to define ADHD oversimplifies the disorder

- Attention and impulse control are **closely connected developmentally**



Intellectual abilities

- most children with **ADHD have at least normal intelligence** - the difficulty lies in applying intelligence to everyday life situations



Impaired academic functioning

- children with ADHD frequently have **lower productivity, grades, and scores on achievement tests**
- **attention involved in many academic functions**

DSM-5 Diagnostic Criteria for ADHD - Inattention

Inability to sustain attention, particularly for repetitive, structured, and less enjoyable tasks

- deficits may be seen in one or more types of attention : attentional capacity / selective attention / distractibility / sustained attention / vigilance (a core feature)

TABLE 8.1 | Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder

DSM-5

(A) A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

(1) Inattention: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely the manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

- (a) Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
- (b) Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
- (c) Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).
- (d) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- (e) Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- (f) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
- (g) Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- (h) Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).
- (i) Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

DSM-5 Diagnostic Criteria for ADHD - **Hyperactivity & Impulsivity**

Inability to voluntarily inhibit dominant or ongoing behavior

- **Hyperactive behaviors** : fidgeting and difficulty staying seated / moving, running, touching everything in sight, excessive talking, and pencil tapping, excessively energetic, intense, inappropriate, and not goal-directed
- **Impulsivity : inability to control immediate reactions or to think before acting** : cognitive impulsivity includes disorganization, hurried thinking, and need for supervision
 - **behavioral impulsivity** : difficulty inhibiting responses when situations require it
 - **emotional impulsivity** : impatience, low frustration tolerance, hot temper, quickness to anger, and irritability

(2) Hyperactivity and Impulsivity Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or a failure to understand tasks or instructions. **For older adolescents and adults (age 17 or older), at least five symptoms are required.**

(a) Often fidgets with or taps hands or feet or squirms in seat.

(b) Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).

(c) Often runs about or climbs in situations where it is inappropriate.

Note: In adolescents or adults, may be limited to feeling restless.

(d) Often unable to play or engage in leisure activities quietly.

(e) Is often "on the go," acting as if "driven by a motor" (e.g., is unable to be or is uncomfortable being still for extended time, as in restaurants, meetings; may be seen by others as being restless or difficult to keep up with).

(f) Often talks excessively.

(g) Often blurts out answers before a question has been completed (e.g., completes people's sentences; cannot wait for a turn in conversation).

(h) Often has difficulty waiting his or her turn (e.g., while waiting in line).

(i) Often interrupts or intrudes on others (e.g., butts into conversations, games or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

Additional DSM-5 Diagnostic Criteria for ADHD

Appears **prior to age 12**

Persists more than 6 months

Occurs more **often** and with greater **severity** compared to children of the **same age** and **sex (different thresholds formales and female - questionnaires)**

Occur across two or more settings (home, school, activities, tassesment, etc.)

Interferes with social or academic performance

Not explained by another disorder

- (B) Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.
- (C) Several inattentive or hyperactive-impulse symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).
- (D) There must be clear evidence that the symptoms interfere with, or reduce the quality of, social academic, or occupational functioning.
- (E) The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

(continues)

ADHD - predominantly inattentive or hyperactive-impulsive **presentation**

Predominantly **inattentive** presentation (ADHD-PI)

- **Inattentive, drowsy, day-dreamy, aloof, spacey, in a fog, and easily confused**
- May have **co-occurring SLD** : **process** information **slowly**, have **trouble remembering** things, and display **low academic achievement**
- Often **anxious**, apprehensive, **socially withdrawn**, and may display **mood disorders**

Predominantly **hyperactive–impulsive** presentation (ADHD-HI)

- Primarily symptoms of hyperactivity-impulsivity (rarest group)
- Primarily includes preschoolers and may have limited validity for older children
- May be a distinct subtype of ADHD-C

TABLE 8.1 | Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder (continued)

Specify whether:

Combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

Predominantly inattentive presentation: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

Predominantly hyperactive–impulsive presentation: If Criterion A2 (hyperactivity–impulsivity) is met but Criterion A1 (inattention) is not met for the past 6 months.

Specify if:

In partial remission: When full criteria were previously met, fewer than the full criteria have been met for the past 6 months, and the symptoms still result in impairment in social, academic, or occupational functioning.

Specify current severity:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis are present, and symptoms result in no more than minor impairments in social or occupational functioning.

Moderate: Symptoms or functional impairment between “mild” and “severe” are present.

Severe: Many symptoms in excess of those required to make the diagnosis, or several symptoms that are particularly severe, are present, or the symptoms result in marked impairment in social or occupational functioning.

ADHD - prevalence and course

Worldwide prevalence of ADHD has been estimated at **5.29%** (Polanczyk et al 2007)

Prevalence rates **vary widely** with sampling methods

- Estimates: 6-7% of school-age children and adolescents in North America and 5% worldwide have ADHD
- **ADHD is one of the most common referral problems seen at clinics**

5.4-fold increase in prevalence from **1979 - 1996** in US

- partially explained by changes in diagnostic criteria (DSM-III to DSM-IV)

ADHD persists in adulthood for about about **50 - 65% of diagnosed children** (Faraone et al 2006)

- persistence related to ADHD symptom severity, number of symptoms, ADHD subtype, ADHD in relatives, psychosocial adversity, psychiatric comorbidities, and/or parental psychopathology

Many adults with ADHD are undiagnosed and untreated

ADHD - gender

ADHD occurs more frequently in **boys**

- girls with ADHD may be under-identified and undertreated - less behavioural manifestations

Ratio in clinical samples is **6:1** with boys being referred more often than girls

- ADHD in girls may go unrecognized and unreported

Overall rates decrease in adolescence for both sexes - ratio remains the same

DSM criteria (cutoffs and symptoms) may be **more appropriate** for **boys** than girls

Girls with ADHD may be more likely to display **inattentive/disorganized symptoms**

Girls with ADHD who display **impulsive-hyperactive behaviors** **more likely** to develop **eating disorder** symptoms

ADHD - comorbid diagnoses - children

Up to 80% of children with ADHD have a co-occurring psychological disorder

Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD)

- common genetic contribution for ADHD, ODD, and CD
- Family connections – there is evidence for a contribution from a shared environment

Mood disorders

- ADHD at 4-6 years is a risk factor for future depression and suicidal behavior
- **20-30% of children with ADHD experience depression**
 - family risk for one disorder may increase the risk for the other

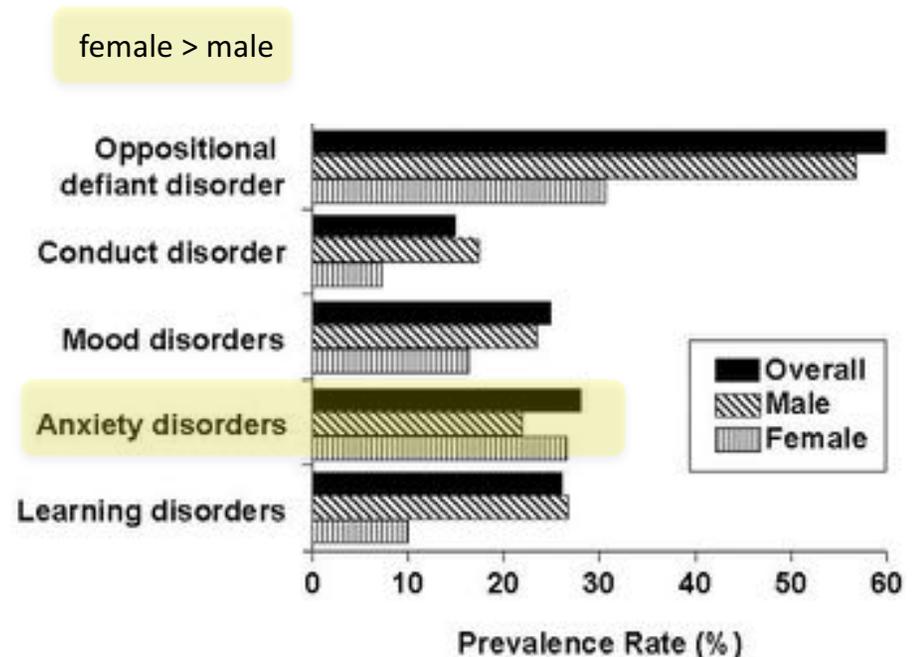


Figure 1. Approximate prevalence of comorbid diagnoses in children with attention-deficit/hyperactivity disorder.

ADHD - comorbid diagnoses - **children** (cont'd)

female > male

Anxiety disorders

- about 25% of children with ADHD experience excessive anxiety
- children with co-occurring anxiety
 - Display social and academic difficulties
 - Experience greater long-term impairment and mental health problems

Learning disorders

- about 25% of children with ADHD have difficulty with reading, writing and/or math

+ speech-related difficulties

- difficulty understanding others' speech
- excessive and loud talking
- frequent shifts and interruptions in conversation
- inability to listen
- inappropriate conversations
- speech production errors

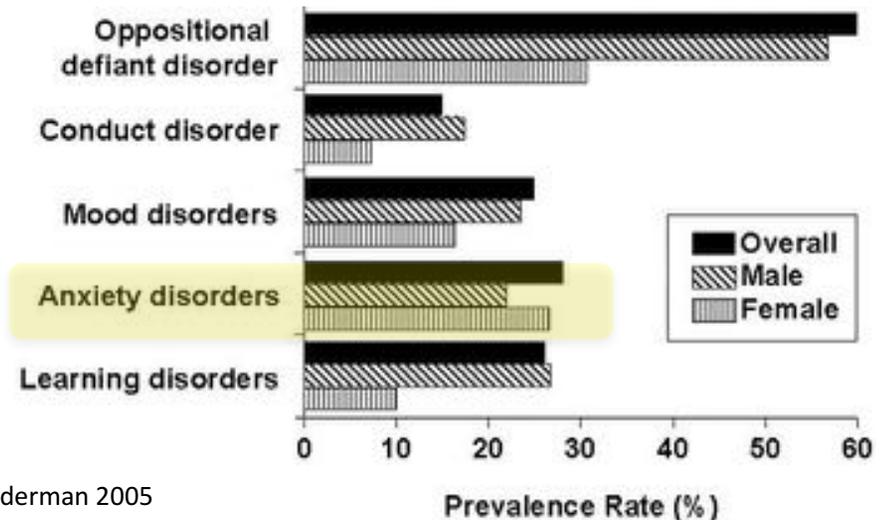


Figure 1. Approximate prevalence of comorbid diagnoses in children with attention-deficit/hyperactivity disorder.

ADHD - comorbid diagnoses - adults

Many **children** with **ADHD** do not **outgrow** **problems** and some can get much worse

At least **50%** of **clinic-referred elementary school children** continue to **deal with ADHD** into **adolescence**

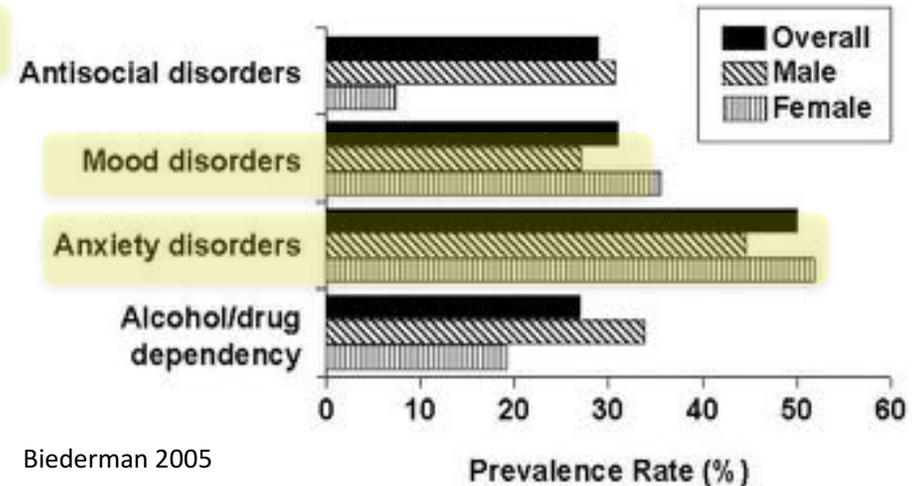
Adult challenges (Shaw et al., 2012)

- drug use/addictive behaviour,
- academic outcomes,
- antisocial behaviours,
- social function
- occupation

BUT

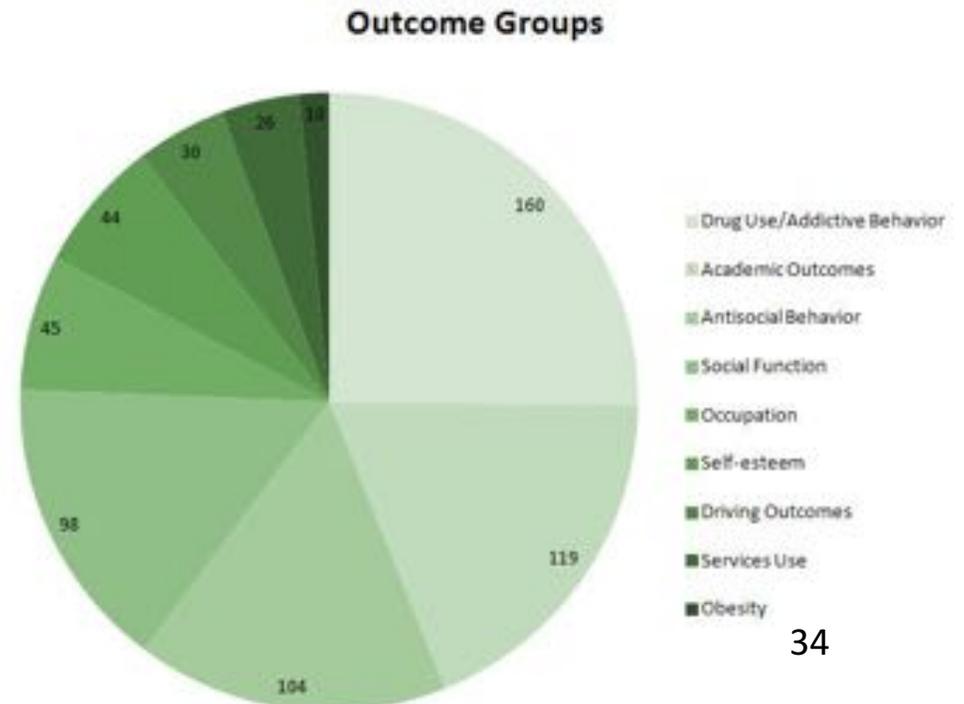
- Some **individuals** either **outgrow** or **learn to cope with their disorder by adulthood**
- ADHD is established as an adult disorder

female > male



Biederman 2005

Figure 2. Approximate prevalence of comorbid diagnoses in adults with attention-deficit/hyperactivity disorder.



ADHD - genetics

ADHD runs in families

Family studies:

- sibling risk increases **2 - 5x**
- **3 - 5x increased** likelihood that **parent is affected (9 - 35%)**

Twin studies

- 75% heritability estimates for hyperactive-impulsive and inattentive behaviors

Specific gene studies

- Genes may contribute to the expression of ADHD – focus on **dopamine regulation**

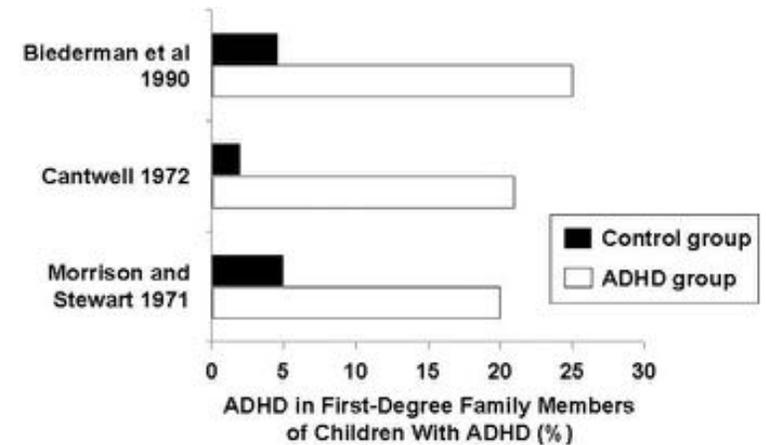


Figure 3. Family studies in attention-deficit/hyperactivity disorder (ADHD).

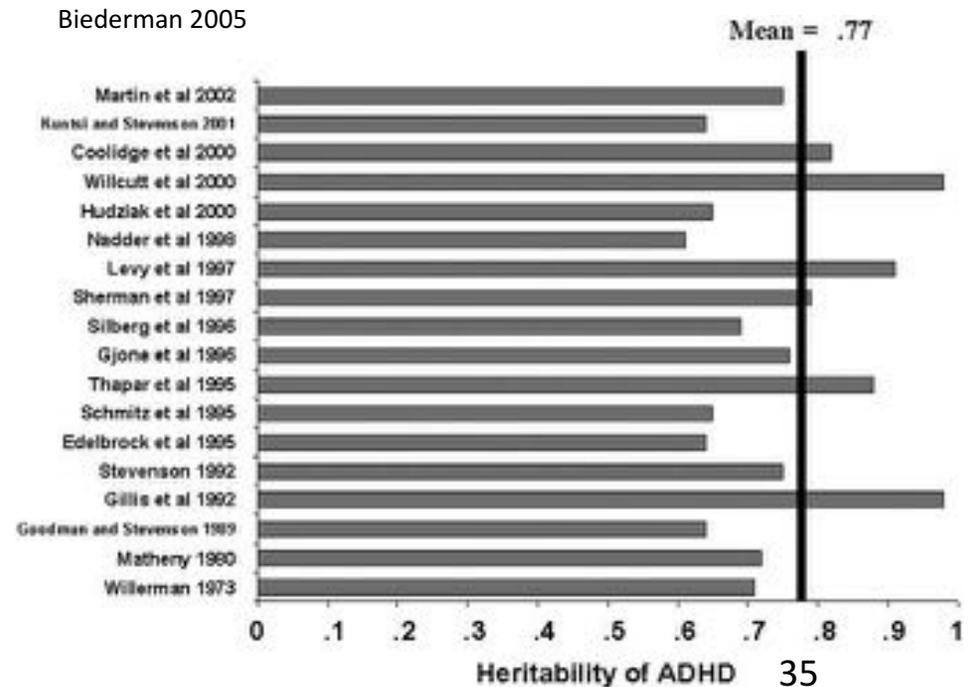


Figure 4. Heritability of attention-deficit/hyperactivity disorder (ADHD).

ADHD - pharmacology

Current models of ADHD : complicated and not completely understood, but ..

- implication **dopaminergic** and **noradrenergic system imbalances** related to core symptoms

consensus ... **prefrontal lobe dysfunction** and the connections between the **frontal lobe** and key **subcortical regions** underlie ADHD

Medications increase neurotransmission in these systems ...

- **dopaminergic** : Adderal, Ritalin, Concerta
- **noradrenergic** : Strattera
 - not a psychostimulant - selective norepinephrine reuptake inhibitor - SNRI)
 - Alternative - for kids who experience lots of irritability on stimulants

liberation type i.e., immediate vs Slow-release

initial dose i.e., 5mg vs 20 mg

duration of action i.e., 4 vs 12 hrs

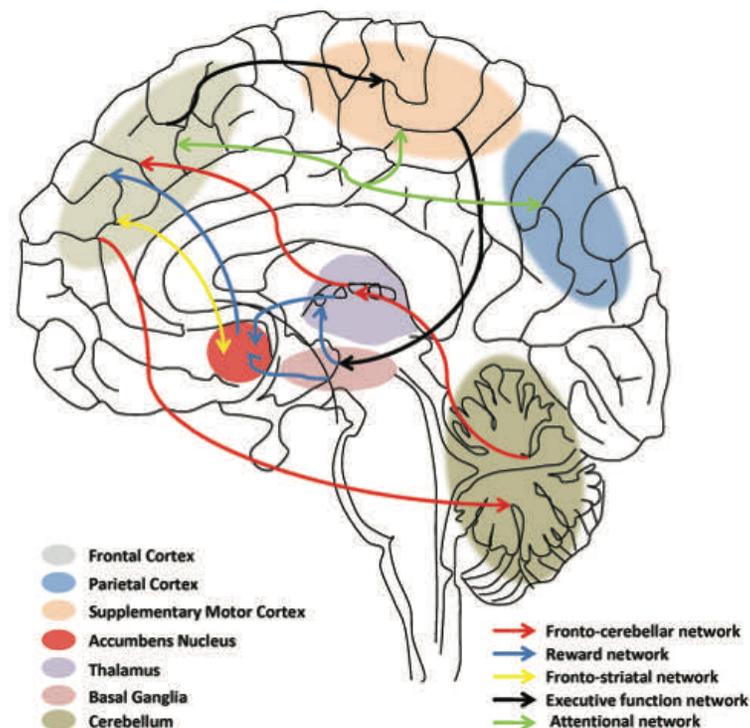
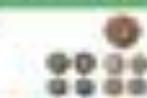
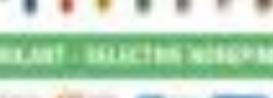
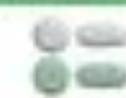


Figure 1. Schematic representation of functional circuits involved in the pathophysiology of ADHD. Here are summarized the attentional network (*green*), the fronto-striatal network (*yellow*), the executive function network (*black*), the fronto-cerebellar network (*red*), and the reward network (*blue*).

CADDRA Guide to ADHD Pharmacological Treatments in Quebec - 2018

Medications available and descriptions	Characteristics	Duration of action ¹	Starting dose ¹	Dose titration as per product monograph	Dose titration as per CADDRA (www.caddra.ca)	EMC coverage (code)
AMPHETAMINE-BASED PSYCHOSTIMULANTS						
Desoxin® 50/40/3 mg 	Pill can be crushed ² Spansule with chitoshan	- 4 h - 4 - 6 h	Tablets - 1.5/0.5/0.5 mg QD Spansules - 0.5 mg q.d. bid	↑ 1.5 - 3 mg of weekly intervals Max. desoxin (q.d. or b.i.d.) 50/40/3 + 40 mg	↓ 1.5 - 3 mg/day of weekly intervals Max. desoxin (q.d. or b.i.d.) 50/40/3 and Adolescents + 20 - 30 mg Adults + 50 mg	Covered Covered
Adderall XR® Capsules 5, 10, 15, 20, 25, 30 mg 	Spansule Stimulant	- 12 h	5 - 10 mg q.d. bid	↓ 5 - 10 mg of weekly intervals Max. desoxin Children + 20 mg Adolescents and Adults + 30 - 50 mg	Children ↑ 1 mg of weekly intervals Max. desoxin + 30 mg Adolescents and Adults ↓ 1 mg of weekly intervals Max. desoxin + 50 mg	Optional medication Child/Adolescent (DREB) Adult (DREB)
Vyvanse® capsules 10, 20, 30, 40, 50, 60, 70 mg 	Capsule content can be diluted in water, orange juice and yogurt ³	- 10 - 14 h	20 - 30 mg q.d. bid	↑ to clinical discretion of weekly intervals Max. desoxin 40 caps + 40 mg	↓ 5 mg of weekly intervals Max. desoxin Children + 10 mg Adolescents and Adults + 20 mg	Optional medication Child/Adolescent (DREB) Adult (DREB)
NON-AMPHETAMINE-BASED PSYCHOSTIMULANTS						
Methylphenidate short acting tablets 2 mg (same as) 10, 20 mg (Adalat) ⁴ 	Pill can be crushed ²	- 2 - 4 h	5 mg bid to 1.5 mg bid + spacer q.d.	↑ 5 - 10 mg of weekly intervals Max. desoxin All ages + 40 mg	↓ 5 mg of weekly intervals Max. desoxin Children and Adolescents + 40 mg Adults + 50 mg	Covered
Dexedrine® Capsules 5, 10, 20, 30, 40, 50, 60, 80 mg 	Spansule Stimulant	- 6 - 12 h	30 - 25 mg q.d. bid	↑ 5 mg of weekly intervals Max. desoxin Children and Adolescents + 40 mg Adults + 50 mg	↓ 5 - 10 mg of weekly intervals Max. desoxin Children + 40 mg Adolescents and Adults + 50 mg	Optional medication Child/Adolescent (DREB) Adult (DREB)
Exelon® Extended Release Table 10, 20, 30, 54 mg 	Pill needs to be crushed ² while in bag following mechanism effect	- 12 h	30 mg q.d. bid	↓ 10 mg of weekly intervals Max. desoxin Children + 10 mg Adolescents + 20 mg / Adults + 30 mg	↓ 5 - 10 mg of weekly intervals Max. desoxin Children + 10 mg Adolescents + 20 mg / Adults + 30 mg	Optional medication Child/Adolescent (DREB) Adult (DREB)
Requital® Capsules 25, 35, 45, 75, 75, 80, 100 mg 	Spansule Stimulant	- 8 h	25 mg q.d. bid	↓ 10-15 mg in intervals of 1 or 2 days Max. desoxin Adults + 50 mg	↓ 10-15 mg in intervals of 1 or 2 days Max. desoxin Adults + 50 mg	Optional patient demand
NON-PSYCHOSTIMULANT - SELECTIVE NOREPINEPHRE/DOPE AMINE REINER						
Strattera® (atomoxetine) Capsules 10, 18, 25, 40, 60, 80 mg 	Capsule needs to be crushed ² while in water to see effect	Up to 24 h	Children and adolescents 0.2 mg/kg/day Adults + 40 mg q.d. for 7-14 days	Wait for dose for a maximum of 7-14 days before adjusting Children + 0.4 mg/kg/day 10 mg in Adults + 40 mg Max. desoxin 1.0 mg/kg/day + 100 mg	Wait for dose for a maximum of 7-14 days before adjusting Children + 0.4 mg/kg/day 10 mg in Adults + 40 mg Max. desoxin 1.0 mg/kg/day or 100 mg	Optional medication Child/Adolescent Optional patient demand Adult
NON-PSYCHOSTIMULANT - SELECTIVE ALPHA-1 ADRENERGIC RECEPTOR ANTAGONIST						
Jelmax XR® Guanfacine ER Extended Release Table 1, 2, 3, 4 mg 	Pills need to be crushed ² while in bag following mechanism effect	Up to 24 h	1 mg q.d. morning or evening	Wait for dose for a maximum of 7 days before adjusting by no more than 1 mg increment weekly Max. desoxin Monotherapy 4-12 years 4 mg 10 mg 13-17 y In combination Therapy to psychostimulants 4-12 years 4 mg	Wait for dose for a maximum of 7 days before adjusting by no more than 1 mg increment weekly Max. desoxin Monotherapy 4-12 years 4 mg 10 mg 13-17 y In combination Therapy to psychostimulants 4-12 years 4 mg	Optional medication Child/Adolescent Optional patient demand Adult

¹ Each medication is not effective and non-therapeutic if the specific dose is not to that, when and with/without medication, duration as well as when to be available ERB (the two conditions were added up). ² Information on crushing medications should always refer to the manufacturer's instructions. The crushing must be done in a clean, dry container and should be done in a clean, dry container. ³ Vyvanse capsules should be crushed in water, orange juice and yogurt. ⁴ Exelon tablets should be crushed in water, orange juice and yogurt. ⁵ Strattera capsules should be crushed in water, orange juice and yogurt. ⁶ Strattera capsules should be crushed in water, orange juice and yogurt. ⁷ Strattera capsules should be crushed in water, orange juice and yogurt. ⁸ Strattera capsules should be crushed in water, orange juice and yogurt. ⁹ Strattera capsules should be crushed in water, orange juice and yogurt. ¹⁰ Strattera capsules should be crushed in water, orange juice and yogurt. ¹¹ Strattera capsules should be crushed in water, orange juice and yogurt. ¹² Strattera capsules should be crushed in water, orange juice and yogurt. ¹³ Strattera capsules should be crushed in water, orange juice and yogurt. ¹⁴ Strattera capsules should be crushed in water, orange juice and yogurt. ¹⁵ Strattera 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ADHD - establishing diagnosis - multifactorial

There is no **single test** to identify ADHD

Clinical Interview

- diagnostic **assessment** of **primary** complaint
- **medical**, psychiatric & **developmental** History
- detailed **educational** history
- detailed **family & social** history

Behavioural assessment

- **observation** (interview/in-class, etc)
- **questionnaires**

Psycho-educational / Neuropsychological assessment

- **intellectual functioning**
- **achievement**
- **mostly "executive functioning / frontal" tests**
 - organization, attention (sustained, selective, distributed), working memory (recall / interference), inhibition, self-regulation / monitoring, etc.

TABLE 8.2 | Impaired Executive Functions in ADHD and Examples of Resulting Impairments

Impaired Executive Function	Resulting Impairment
1. Organize, prioritize, and activate	Trouble getting started Difficulty organizing work Misunderstand directions
2. Focus, shift, and sustain attention	Lose focus when trying to listen Forget what has been read and need to reread Easily distracted
3. Regulate alertness, effort, and processing speed	Excessive daytime drowsiness Difficulty completing a task on time Slow processing speed
4. Manage frustration and modulate emotion	Very easily irritated Feelings hurt easily Overly sensitive to criticism
5. Working memory and accessing recall	Forget to do a planned task Difficulty following sequential directions Quickly lose thoughts that were put on hold
6. Monitor and regulate action	Find it hard to sit still or be quiet Rush things, slapdash Often interrupt, blurt things out

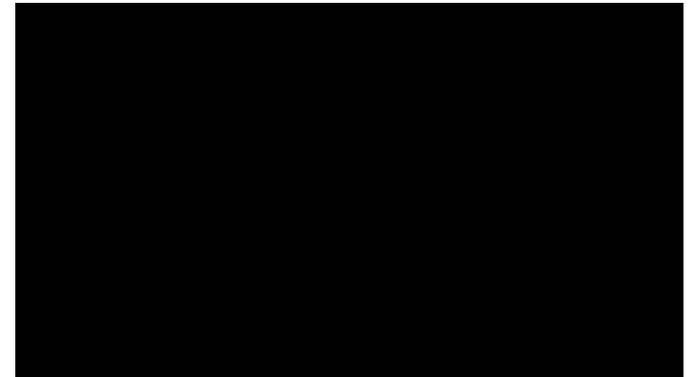
ADHD - neuropsychological test sensitive to ADHD

Nigg (2005) in a meta-analysis identified the most common abnormalities in various neuropsychological tasks in ADHD (listed by Effect Size):

Table 2. Selected Meta-analytic Findings in Neuropsychology of ADHD Versus Non-ADHD Children

Measure	Effect Size (<i>d</i>)
Spatial Working Memory (Spatial Span)	.75 ^a to .85 ^b to 1.14 ^b
Response Suppression (Stop Task SSRT/SSRT Slope)	.61 ^a to .64 ^c to .94 ^d
Signal Detection (CPT d-prime) Arousal	.72 ^e
Stroop Naming Speed	.69 ^f
Full Scale IQ	.61 ^g
Set Shifting (Trails B Time)	.55 ^a to .59 ^g to 0.75 ^d
Planning (Tower of London/Hanoi)	.51 ^a to .69 ^a
Mazes	.58 ^a
Verbal Working Memory	.51 ^a to .41 ^b
Decision Speed on Go-Task	.49 ^c
WCST Perseverations	.35 ^g /.36 ^a to .53 ^h
Fluency	.27 ^d
Stroop Interference	.25 ^f
Covert Visual Spatial Orienting	.20 ⁱ

CPT press bar except after X



ADHD - treatment

Less than 50% of kids with ADHD receive treatment

- Of those who do many discontinue ...

The **primary treatment** approach combines:

- **Parent management** training
- **Educational** intervention
- **Stimulant** medication

TABLE 8.3 | Treatments for Children with ADHD

Primary Treatments	Focus of Treatment
Stimulant medication	Managing ADHD symptoms at school and home
Parent management training	Managing disruptive child behavior at home, reducing parent-child conflict, and promoting prosocial and self-regulating behaviors
Educational intervention	Managing disruptive classroom behavior, improving academic performance, teaching prosocial and self-regulating behaviors
Intensive Treatment	Focus of Treatment
Summer treatment programs	Enhancing present adjustment at home and future success at school by combining many of the primary and additional treatments in an intensive summer treatment program

Additional Treatments	Focus of Treatment
Family counseling	Coping with individual and family stresses associated with ADHD, including mood disturbance and marital strain
Support groups	Connecting adults with other parents of children with ADHD, sharing information and experiences about common concerns, and providing emotional support
Individual counseling	Providing a supportive relationship in which the youth can discuss personal concerns and feelings

interventions : home / parents

Establish / maintain structure as much as possible !

- follow a **routine** - Establish simple /predictable rituals for meals, homework, play, and bed.
- use **clocks /timers** throughout home - allow enough time for homework, getting ready in the a.m., transitional times (b/n finishing play and bedtime).
- **simplify (balance) schedule** - keep busy but not too many activities
- create a **quiet** place - quiet space with no distractions
- be **neat & organized** - as much as possible ...

Rules must be clear and simple

- write down **rules easily understood** by child - hang them up/available.
- **follow up** every time with a reward or consequence (+ve reinforcement !) – no food/toys, use immediate rewards, can chart rewards / point system

Homework ...

- gradually build on time expended during tasks without breaks.
- provide step-by-step instruction, specifically for longer, more laborious work.

Try to eat and sleep as well as possible ...

GUIDE TO ADHD PSYCHOSOCIAL INTERVENTIONS

At Home

Instructional

- Make eye and/or gentle physical contact before giving one or two clear instructions. Have instructions repeated back, or confirm they were understood, before proceeding

Behavioral

- Use a positive approach and calm tone of voice. Teach calming techniques to de-escalate conflict
- Use praise, catch them being good (playing nicely)
- Set clear attainable goals and limits (homework and bedtime routines, chores) and connect them to earning privileges, special outings etc.
- Use positive incentives and natural consequences: *When you... then you may...*
- Empathy statements can be useful, such as *I understand*
- Adults should model emotional self-regulation and a balanced lifestyle (good eating and sleep habits, exercise and hobbies)
- Choices should be limited to two or three options

Environmental

- Structure and routine are essential. Parents/partners must be united, consistent, firm, fair and follow through
- Encourage prioritizing instead of procrastination
- Post visual reminders (rules, lists, sticky notes, calendars) in prominent locations
- Use timers/apps for reminders (homework, chores, limiting electronics, paying bills)
- Keep labeled, different coloured folders or containers in prominent locations for items (keys, electronics).
- Find the work area best suited to the individual (dining table, quiet area)
- Break down tasks
- Allow movement breaks
- Allow white noise (fan, background music) during homework or at bedtime

Other referrals may be needed:

- Psychologist
- Tutor, Family Therapist
- Parenting Programs

- Social Skills Program
- Organizational Skill Course
- Occupational Therapist
- Speech and Language

At School

Instructional

- Keep directions clear and precise
- Get student's attention before giving instructions
- Check understanding and provide clarification as needed
- Actively engage the student by providing work at the appropriate academic level

Behavioral

- Provide immediate and frequent feedback
- Use direct requests – *when...then*
- Visual cues for transitions
- Allow for acceptable opportunities for movement – "walking passes"

Environmental

- Preferential seating
- Quiet place for calming down

Accommodations

- Chunk and break down steps to initiate tasks
- Provide visual supports to instruction
- Reduce the amount of work required to show knowledge
- Allow extended time on tests and exams
- Provide note taker or access to assistive technology
- Supports can include the CADDRA psychoeducational and accommodations template
- Request school support services

- Audiologist
- Learning Strategist
- ADHD Coach
- Vocational Coach

At Work

Accommodations

- Identify accommodation needs
- Provide CADDRA workplace accommodations template

Counsel

- Suggest regular and frequent meetings with manager and support collaborative approach
- Set goals, learn to prioritize, review progress regularly
- Identify time management techniques that work for the client, e.g. using a planner, apps
- Declutter and create a work-friendly environment

Tools

- Organizational apps and/or productivity websites caddra.ca/medical-resources/psychosocial-information

Relationships

- Understand the impact ADHD can have on relationships with partners, family, friends, teachers, peers and co-workers.
- Recognize and accept ADHD can cause unintended friction and frustration between parent and child as well as between partners (e.g. difficulties with self-regulation, time management difficulties)
- Learn how to listen and communicate effectively
- Organize frequent time to communicate (don't just talk) to discuss goals and plans (what works, what doesn't) within home, educational and work environments
- Schedule regular fun with family, partner, friends
- Practice relaxation and mindfulness techniques caddra.ca/medical-resources/psychosocial-information
- Stay calm, be positive, recognize/validate and celebrate strengths!

resources

Canadian ADHD Resource Alliance (CADDRA)

<http://www.caddra.ca/>

CADDRA is a Canadian non-industry, not-for-profit, independent association. An alliance of healthcare professionals supporting patients with ADHD and their families.



Le Regroupement des Associations PANDA du Québec

<http://www.associationpanda.qc.ca>

Quebec-based association whose aim is to aid persons with ADHD and their families.



ASD

Kanner (1943)

Bleuler (1911)

- described withdrawal from social relations into a rich fantasy life seen in individuals with schizophrenia
- derived from - *autos* (self) and *ismos* (condition)

Kanner (1943)

- case history of 11 children (case 1 = Donald T)
- inattention of outside world = “extreme autistic aloneness”
- social isolation, stereotyped behavior, resistance to change, echolalia
- « infantile autism »
- congenital in nature

Asperger syndrome (1943) : another form of « autism »

PATHOLOGY

To understand and measure emotional qualities is very difficult. Psychologists and educators have been struggling with that problem for years but we are still unable to measure emotional and personality traits with the exactness with which we can measure intelligence.

—ROSE ZELAZO in *Glimpses into Child Life**

AUTISTIC DISTURBANCES OF AFFECTIVE CONTACT

By LEO KANNER

SINCE 1938, there have come to our attention a number of children whose condition differs so markedly and uniquely from anything reported so far, that each case merits—and, I hope, will eventually receive—a detailed consideration of its fascinating peculiarities. In this place, the limitations necessarily imposed by space call for a condensed presentation of the case material. For the same reason, photographs have also been omitted. Since none of the children of this group has as yet attained an age beyond 11 years, this must be considered a preliminary report, to be enlarged upon as the patients grow older and further observation of their development is made.

Case 1. Donald T. was first seen in October, 1938, at the age of 5 years, 1 month. Before the family's arrival from their home town, the father sent a thirty-three-page typewritten history that, though filled with much obsessive detail, gave an excellent account of Donald's background. Donald was born at full term on September 8, 1933. He weighed nearly 7 pounds at birth. He was breast fed, with supplementary feeding, until the end of the eighth month; there were frequent changes of formulas. "Eating," the report said, "has always been a problem with him. He has never shown a normal appetite. Seeing children eating candy and ice cream has never been a temptation to him." Dentition proceeded satisfactorily. He walked at 13 months.

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From the Henry Phipps Psychiatric Clinic and the Harriet Lane Home for Children, the Johns Hopkins Hospital, and (cases 1 and 11) the Child Study Center, Baltimore, Maryland.

* See THE RECENT BOOKS.



definition of autism (ASD)

DSM I (1952) Schizophrenic reaction, childhood type

“psychotic reactions in children, manifesting primarily **autism** ...”

DSM II (1968) [autism was not mentioned; the word appears only under the following category]

•295.8 **Schizophrenia, childhood type**

This category is for cases in which schizophrenic symptoms appear before puberty. The condition may be manifested by **autistic**, atypical and withdrawn behavior...”

Rutter (1968) - argued autism differed from schizophrenia

- higher M/F ratio
- absence of delusions and hallucinations
- stable course (no relapse/improvement)
- need better diagnostic criteria for research

DSM III (1980) - effect on inclusion criteria for research

- diagnostic criteria for **Infantile Autism**

DSM IV (1994) - in larger category of “Pervasive Developmental Disorders”

- autistic disorder
- Asperger syndrome
- pervasive developmental disorder - not otherwise specified (PDD-NOS)
- Rett’s syndrome (rare)
- childhood disintegrative disorder

Autism: Then and Now

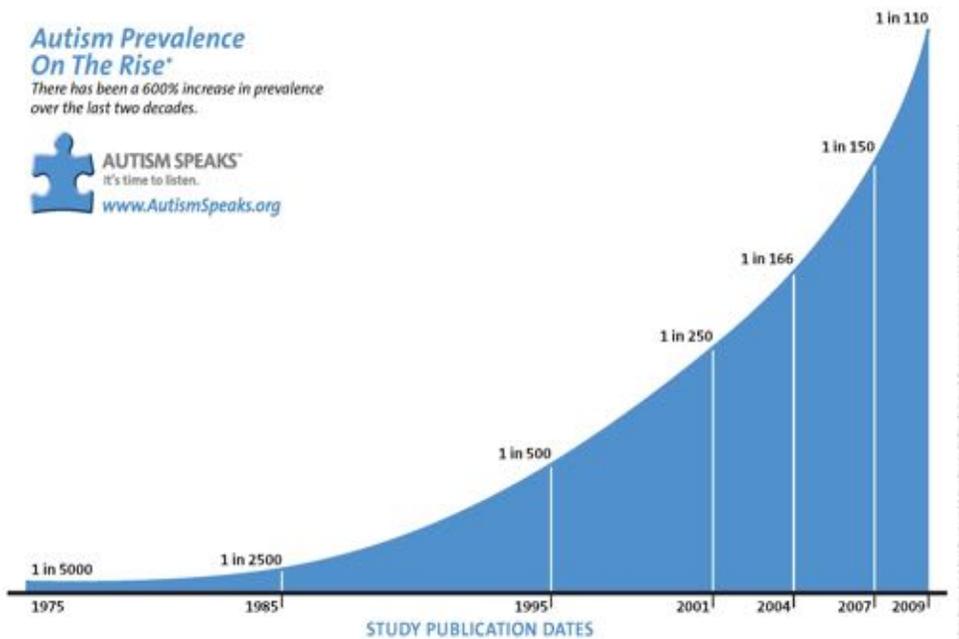
Autism Prevalence On The Rise*

There has been a 600% increase in prevalence over the last two decades.



AUTISM SPEAKS
it's time to listen.

www.AutismSpeaks.org



*Recent research has indicated that changes in diagnostic practices may account for at least 25% of the increase in prevalence.

Wendy Stone, PhD; Mind Institute Lecture Series, 2013

CDC increases estimate of autism prevalence by 15%



More funding for research and services is urgently needed.

DONATE TODAY

CDC researchers collect health and school records for 8-year-old children who live in select U.S. counties. These researchers are part of the Autism and Developmental Disabilities Monitoring Network

Autism: Then and Now

THEN (1980's):

- Prevalence considerably low \approx 3-4 per 10000
- Largely unknown in pop culture
- Emphasis on intellectual disability
- Few educational interventions
- One autism journal

NOW (2015):

- Prevalence 1 in 59 children, 1 in 42 boys in US (CDC, 2018)
- Large awareness, extensive media coverage
- Little emphasis on intellectual impairment
- Recognized heterogeneity / neurodiversity
- MANY autism journals

Autism: empirical evidence vs pop culture?

scientific journals



pop magazines



Autism: Facts we do know

- Autism is **not rare**
- **Neurodevelopmental** condition
- Traditionally characterized as a disorder **of social impairment**
- Highly **heritable**
- **No biological** marker
- **Outcomes** are **variable**
- Everyone with ASD is different = **heterogeneity**



DSM 5 – diagnostic criteria

DSM 5

severity level

- how much support

“clinical specifiers “

- w lang impairment?
- w intel impairment?

= dimensionality

associated features

- know genetics
- epilepsy
- DD

Must meet criteria A, B, C, and D:

- A. Persistent deficits in social communication and social interaction across contexts, not accounted for by general developmental delays, and manifest by all 3 of the following:
1. Deficits in social-emotional reciprocity; ranging from abnormal social approach and failure of normal back and forth conversation through reduced sharing of interests, emotions, and affect and response to total lack of initiation of social interaction,
 2. Deficits in nonverbal communicative behaviors used for social interaction; ranging from poorly integrated-verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures.
 3. Deficits in developing and maintaining relationships, appropriate to developmental level (beyond those with caregivers); ranging from difficulties adjusting behavior to suit different social contexts through difficulties in sharing imaginative play and in making friends to an apparent absence of interest in people
- B. Restricted, repetitive patterns of behavior, interests, or activities as manifested by at least two of the following:
1. Stereotyped or repetitive speech, motor movements, or use of objects; (such as simple motor stereotypes, echolalia, repetitive use of objects, or idiosyncratic phrases).
 2. Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change; (such as motoric rituals, insistence on same route or food, repetitive questioning or extreme distress at small changes).
 3. Highly restricted, fixated interests that are abnormal in intensity or focus; (such as strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
 4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment; (such as apparent indifference to pain/heat/cold, adverse response to specific sounds or textures, excessive smelling or touching of objects, fascination with lights or spinning objects).
- C. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)
- D. Symptoms together limit and impair everyday functioning.



Behavioural and cognitive Heterogeneity = Spectrum

behaviors manifested in a variable manner

- often present different profiles
- 'autisms'
- unique strengths and weaknesses

differ along **three** main axes:

1) Language

- 10 - 20% never develop ability to communicate **verbally** (accompanied by severe delay)

2) Cognitive development

- difficult to assess \Rightarrow language/social challenges interfere with cognitive assessments
- **IQ variable** : across domains / **verbal** vs **non-verbal**
- **savants** : co-occurrence of cognitive delay with particular ability (10%)

3) Symptom severity

- **severe to mild**
- profiles change as a function of development



Stephen Wiltshire, 2009

http://www.youtube.com/watch?v=dAfaM_CBvP8

Diagnosis: Assessment

no single test \Rightarrow diagnosis based entirely on behavioural manifestations

ASD \Rightarrow diagnosed by a **multidisciplinary team** using **standardized instruments**

Developmental history

Autism Diagnostic Interview (ADI-R)

- Semi-structured, Parent Interview

Behaviour

Autism Diagnostic Observation Schedule (ADOS-2)

- Child observation

Cognitive assessment

Clinical expertise involved ...



Diagnosis: Assessment of Symptoms

Parent Report

- Modified Checklist for Autism in Toddlers (M-CHAT)
- Social Communication Questionnaire (SCQ)
- Social Responsiveness Scale (SRS)

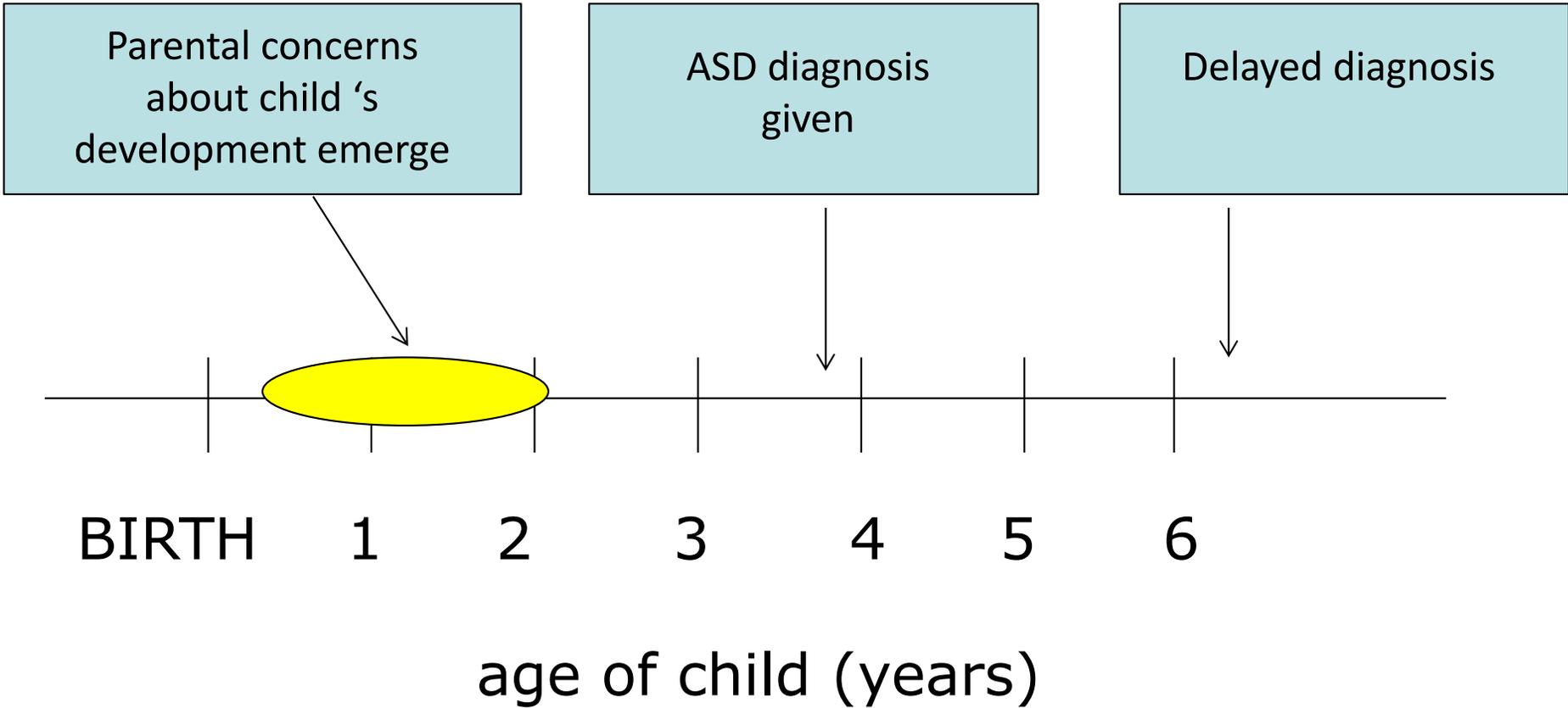
Teacher Report

- Autism Behavior Checklist (ABC)
- Social Responsiveness Scale (SRS)

Child Observation and Rating

- Childhood Autism Rating Scale (CARS)

Diagnosis: timeline



comorbidity

Infrequent id of **comorbid psychiatric disorders** in ASD - **diagnostic overshadowing**

N = 112 (98 males or 7:1 ratio) mean age of 11.5 years

- 50 : PDD; 62 : childhood autism

most common disorders

- **social anxiety disorder (29.2%), ADHD (28.2%), and oppositional, defiant disorder (28.1%).**

identify symptom constellations meeting diagnostic (DSM) criteria.

- suggest that ASD diagnosis should be followed by systematic assessment of other psychiatric conditions
- improve targeted intervention

TABLE 1
Prevalence of *DSM-IV* Disorders

Disorder	3-Mo Point Prevalence/100	95% CI
Any disorder	70.8	58.2–83.4
Any main disorder ^a	62.8	49.8–75.9
Any emotional disorder ^b	44.4	30.2–58.7
Any anxiety or phobic disorders ^c	41.9	26.8–57.0
Generalized anxiety disorder	13.4	0–27.4
Separation anxiety disorder	0.5	0–1.6
Panic disorder	10.1	0–24.8
Agoraphobia	7.9	3.0–12.9
Social anxiety disorder	29.2	13.2–45.1
Simple phobia	8.5	2.8–14.1
Obsessive-compulsive disorder	8.2	3.2–13.1
Any depressive disorder	1.4	0–3.0
Major depressive disorder	0.9	0–2.3
Dysthymic disorder	0.5	0–1.4
Oppositional or conduct disorder	30.0	14.9–45.0
Oppositional defiant disorder	28.1	13.9–42.2
Conduct disorder	3.2	0–7.1
Attention-deficit/hyperactivity disorder	28.2	13.3–43.0
Other disorders ^d	24.7	14.1–35.3
Enuresis	11.0	4.1–17.7
Encopresis	6.6	1.8–11.4
Tourette syndrome	4.8	0.1–9.5
Chronic tic disorder	9.0	3.3–14.6
Trichotillomania	3.9	0–10.3

Note: CIs = confidence intervals.

^aIncludes attention-deficit/hyperactivity disorder, oppositional and conduct disorders, and any emotional disorder.

^bIncludes all anxiety disorders, phobias, and mood disorders.

^cIncludes anxiety disorders, panic disorder, phobias, and obsessive-compulsive disorder.

^dIncludes Tourette syndrome, chronic tics, trichotillomania, enuresis, and encopresis.

Interventions: behaviors and pharmacology

Common target symptoms :

aggression / self injurious behaviour (SIB)/ irritability

- neuroleptics, psychostimulants
- Anticonvulsant medications

inattention and hyperactivity

- Methylphenidate (Ritalin), neuroleptics

anxiety and repetitive behaviors

- Fluoxetine (Prozac - antidepressant – SSRI)
- Fluvoxamine (Luvox - antidepressant)
- Risperidone / Aripiprazole (Risperdal/Abilify - antipsychotic)

Sleep disturbance, tics, depression etc

oxytocin ???

- peptides of the human neuroendocrine system
- effects social cognition
- clinical trials ...



behavioral interventions

early intensive behavioral intervention

- UCLA / Lovaas model – ABA (Lovaas, 1987).
- a systematic approach to skill acquisition - discrete trial training (DTT)
- reinforcement of specific skill, broken down and learned in step-by-step manner
- Pivotal response training (PRT) targets skills that are important (or pivotal) for many other skills
- <http://www.youtube.com/watch?v=iyCx-OLzgJw>

school-based treatment approaches

- TEACCH (treatment and education of autistic and communication related handicapped children) : based on the « autism culture »
- “ structured teaching” - delivered within special education classroom settings.
- uses strengths (usually visual) of child
- <http://www.youtube.com/watch?v=ddGLJ2r4rcw>



social interventions

- social skills groups

communication interventions

- sensory integration therapy
 - brushing (touch), weighted vests (proprio), swings, spinning (vestibular)



<http://www.thetransporters.com/>

cognition in autism : intelligence

longstanding notion of intellectual impairment, but...

large CDC study (2014) :

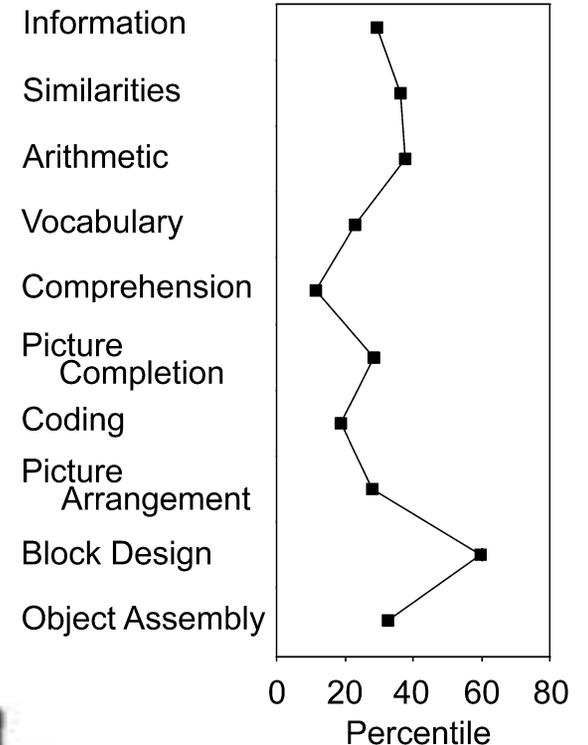
- 31% had intellectual disability (IQ \leq 70).
- 23% were in the borderline range (IQ = 71-85).
- 46% had avg / above avg intellectual ability (IQ $>$ 85).

uneven profile in ASD

- ↑ Performance-based IQ : i.e., block design
- ↓ Verbal based IQ; i.e., vocabulary

Wechsler Intelligence Scales (WIS)

- conventional
- widely available
- rely on verbal instructions



cognition in autism : WISC cognitive profile

Relative Strength : i.e., BD - non-verbal reasoning, perceptual organization, pattern recognition

Relative Weakness : i.e., CO - verbal, social knowledge, social observation ability, society's rules, etc.

Table 2. WISC-IV cognitive profile.

Sample size (sex)	Autistic children		Asperger children		Typical children	
	51 (49M, 2F)		15 (12M, 3F)		42 (29M, 13F)	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Age	10.6	(2.7)	10.6	(2.6)	9.6	(2.3)
Range	7–15		7–15		6–15	
WISC-IV FSIQ	90.7	(12.4)	98.3	(12.4)	103.3	(13.5)
VCI	85.6	(16.1)	110.5	(10.5)	103.3	(16.3)
Similarities	8.4	(2.4)	12.5	(2.0)**	10.6	(3.3)
Comprehension	5.8	(3.0)*	9.3	(2.0)	9.2	(3.0)*
Vocabulary	8.2	(3.6)	13.3	(3.2)**	11.7	(3.5)**
PRI	105.8	(13.3)	101.3	(15.9)	105.2	(11.7)
Block Design	11.0	(3.1)**	9.5	(2.5)	9.9	(3.2)*
Matrix Reasoning	11.7	(2.9)**	10.4	(2.7)	10.8	(2.5)
Picture Concept	10.0	(2.8)**	10.5	(2.0)	11.6	(2.3)**
WMI	87.8	(16.9)	92.7	(15.0)	99.4	(12.6)
Digit Span	7.6	(3.3)*	8.3	(3.1)	9.2	(2.5)*
Letter-Number Sequencing	7.8	(3.2)*	9.3	(1.5)	9.2	(2.4)
PSI	91.5	(14.1)	85.2	(9.3)	101.6	(13.2)
Coding	7.7	(2.7)*	6.7	(1.9)*	10.2	(2.5)
Symbol Search	9.3	(3.3)	8.1	(2.0)*	10.5	(3.0)

WISC-IV: Demographic characteristics and cognitive profile of autistic, Asperger and typical children who completed the WISC-IV.

*Relative weakness.

**Relative Strength.

FSIQ: Full Scale Intelligence Quotient, VCI: Verbal Comprehension Index, PRI: Perceptual Reasoning Index, WMI: working Memory Index, PSI: Processing Speed Index.

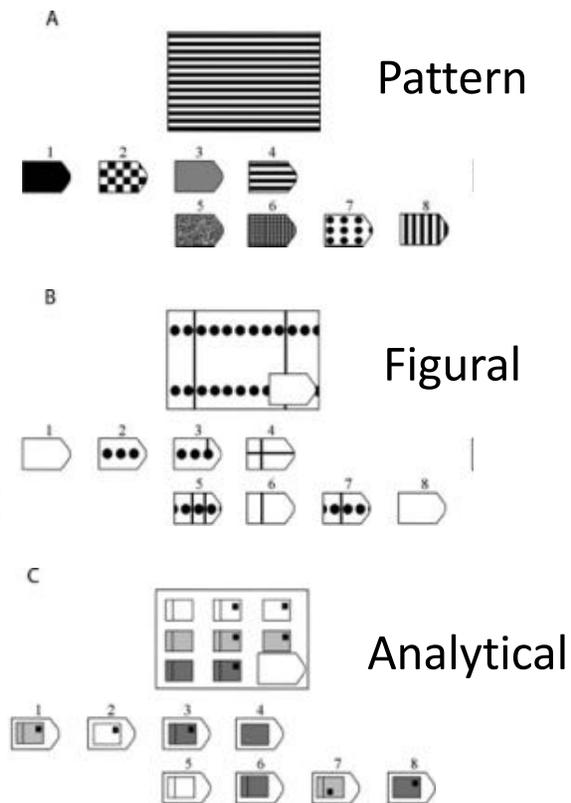
cognition in autism : WISC vs RPM

Raven Progressive Matrices

assess fluid intelligence, reasoning & novel problem-solving abilities

self-paced

minimal verbal instructions



Does WISC-IV Underestimate the Intelligence of Autistic Children?

Anne-Marie Nader · Valérie Courchesne ·
Michelle Dawson · Isabelle Soulières

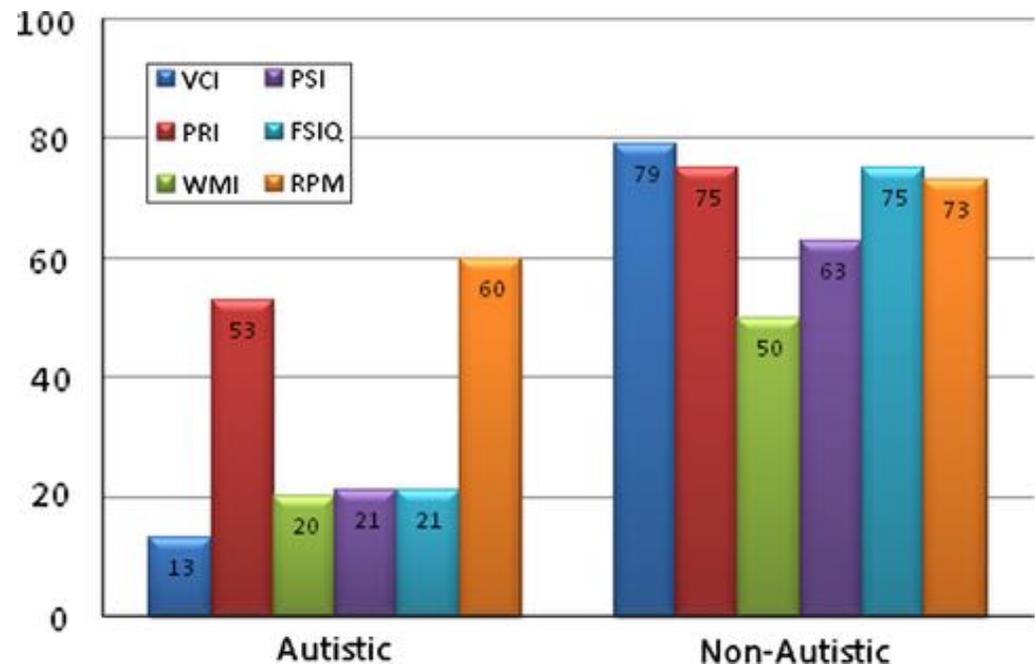


Fig. 1 For each group, performance in percentiles on WISC-IV FSIQ, the 4 WISC-IV indexes, and RPM

origin : functional connectivity (FC) hypotheses

ASD = widespread disorder of association cortex, development of connectivity, only secondarily as a behavioral disorder

“ systems-level approach “

abnormalities in genetic code for brain development



abnormal mechanisms of brain development



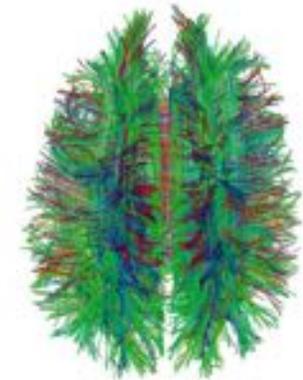
structural and functional abnormalities of brain



cognitive and neurologic abnormalities



behavioral syndrome



neurogenetic condition : where polygenetic changes affect development of the neural networks underlying **affect, cognition, language** and **perception**,

- define the pathophysiology from gene to behavior
- ultimately support the development of interventions at multiple levels of the sequence (medication, cognition behaviour).

Transitioning : employment

Specific **challenges faced by adults with ASD** in the context of **job seeking and employment** are many and varied;

- understanding complex **job application** materials
- 'thinking on their feet' in an **interview**
- acclimatizing to **new procedures and routines**
- **remembering** and **following instructions**
- **responding flexibly** to **unexpected** situations
- planning and juggling **multiple tasks**
- **communicating effectively / interacting socially** with co-workers;
- **managing sensory sensitivities** in the workplace

Employment in which adults with ASD may perform **extremely well**;

- work requiring **visual thinking**
- **systematic information processing** or **precise technical abilities** (e.g. architect, librarian, computer programmer).

care must be taken **not to stereotype the vocational interests** and **capabilities** of adults with ASD

Studies suggest that that adults with ASD exhibit **many exemplary characteristics as employees**;

- **honesty, efficiency, precision, consistency, low absenteeism**, and a **disinterest** in 'office politics'

However ... **are employers sensitive to abilities and challenges of adults w ASD in the workplace ?**

Transitioning : employment

large-scale study looking into the working lives of adults who have an autism spectrum disorder with **no co-occurring intellectual disability**.

having a job is **not simply a means to an end (\$)**, rather, adults with AD and HFA (like many other people) view **work primarily as an opportunity to apply their knowledge, skills and interests in a way that is both self- fulfilling and has intrinsic value. BUT ...**

Table 2 Occupation by ANZSCO major group

Occupation major group	<i>n</i>	%
Clerical and administrative workers	29	22.8
Labourers	29	22.8
Professionals	28	22.0
Technicians and trades workers	16	12.6
Community and personal services workers	12	9.4
Managers	7	5.5
Sales workers	3	2.4
Machinery operators and drivers	3	2.4
Total	127	100

Missing data: *n* = 3

Table 6 Positive experiences of employment

Theme	Sub-themes	%
Self-actualisation	Opportunity to apply and develop knowledge, skills and interests	65
	Freedom to be independent, autonomous or creative	
	Sense of being accepted and valued	
	Making a difference in the lives of others or in society	
Social and collegial factors	Positive relationships with colleagues	45
	Enjoyable interactions with clients and customers	
Job roles and work content	Enjoyment of particular job roles and work tasks	36
	Favourable working conditions (e.g. physical Environment, location, hours of work)	
Pay and benefits	Earning money	28
	Benefits and ‘perks’ (e.g. leave allowance, company car, travel opportunities)	

Table 7 Negative experiences of employment

Theme	Sub-themes	%
Job roles and work content	Dissatisfaction with job roles and work tasks (e.g. boring, repetitive or unfulfilling work)	49
	Poor working conditions (e.g. physical environment, location, hours of work)	
Working relationships	Misunderstanding, criticism, ill-treatment or exclusion by others	46
	Difficulties in communicating with or relating to others	
Health and well-being issues	ASD-specific issues (e.g. sensory sensitivities, anxiety)	35
	Other physical and mental health concerns	
Performance and development issues	Lack of adequate instruction, training or support	21
	perceived unfair discipline or dismissal	
Organisational factors	Unfavourable organisational systems and practices (e.g. bureaucracy, favouritism)	14
	Negative workplace culture (e.g. high turnover, excessive ‘office politics’)	
Pay and conditions	Unsatisfactory pay	5
	Poor employment conditions (e.g. not enough leave)	

- **72 % of participants reported not receiving any specific support at work for ASD-related difficulties**
- **66% would have liked such help (i.e., employer, agencies, etc.)**

Final thoughts...development

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* See THE RECENT BOOKS.

born in 1933 :

@ 2 / 3 years of age

- unusual memory for visual information
- happy when alone, avoided contact
- movement / language not spontaneous - repetitive behaviors (hands, fingers, etc.), echolalia, etc.

in 2010 was located ...

- learned to golf (23 years), drive a car (25 years), avid traveler, etc.
- spontaneous language production, routine important, etc.

protective factors influenced the nature and course of development ...

- family's socio-economic (↑\$)
- social situation - accepted as different / small circle of friends / same friends all his life, etc.

Case # 1 : « Donald T » in 2010, 77 years old



The Atlantic, 2010

Suggested Reading and Resources

Suggested Reading:

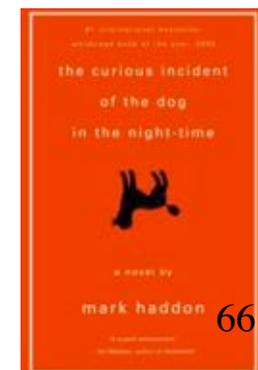
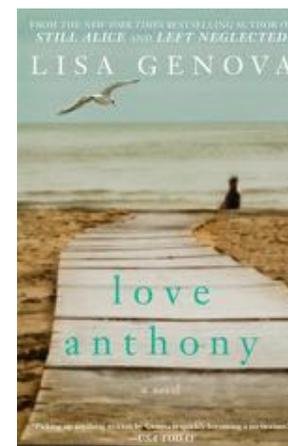
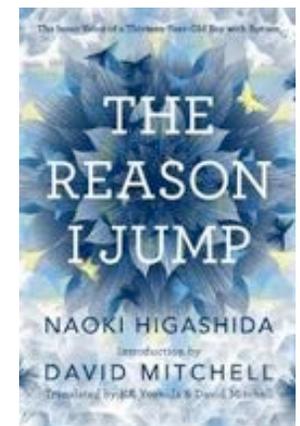
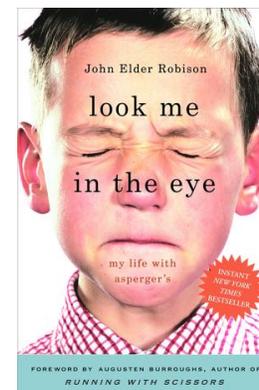
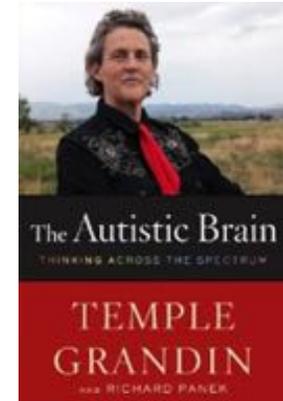
- Autism: A very brief introduction, Uta Frith
- The Autistic Brain, Temple Grandin
- Look Me in the Eye, John Elder Robison
- The Reason I Jump, Naoki Higashida & David Mitchell
- The curious incident of the dog in the night-time, Mark Haddon
- Love Anthony, Lisa Genova

Resources:

www.autismspeak.org

<https://sfari.org>

<http://www.theabilityhub.org/>



THANK YOU