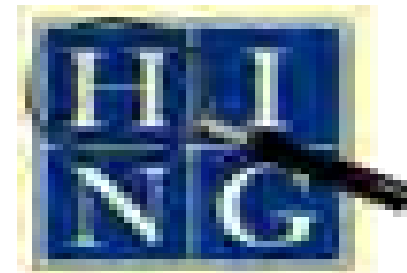




Hidden Impairments: practical issues for occupational health physicians

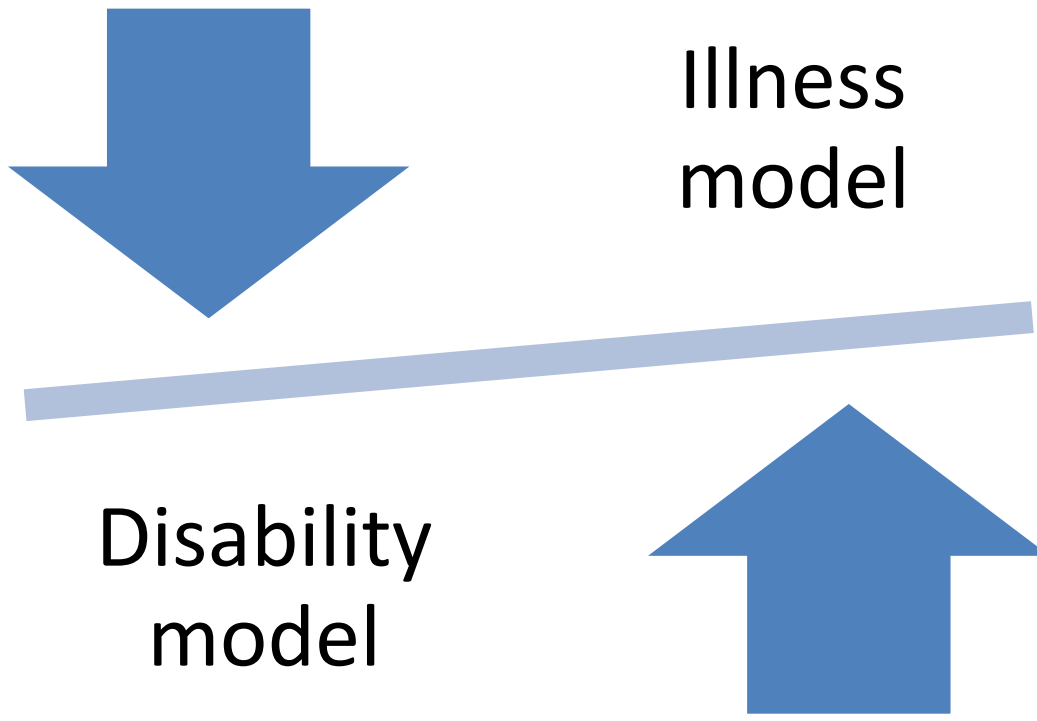
Dr Marios Adamou

MD, MSc, MA, LL.M, MBA, PhD, MRCPsych, DOccMed, CMgr MCMI, FHEA, FRSA, FSB



Objectives

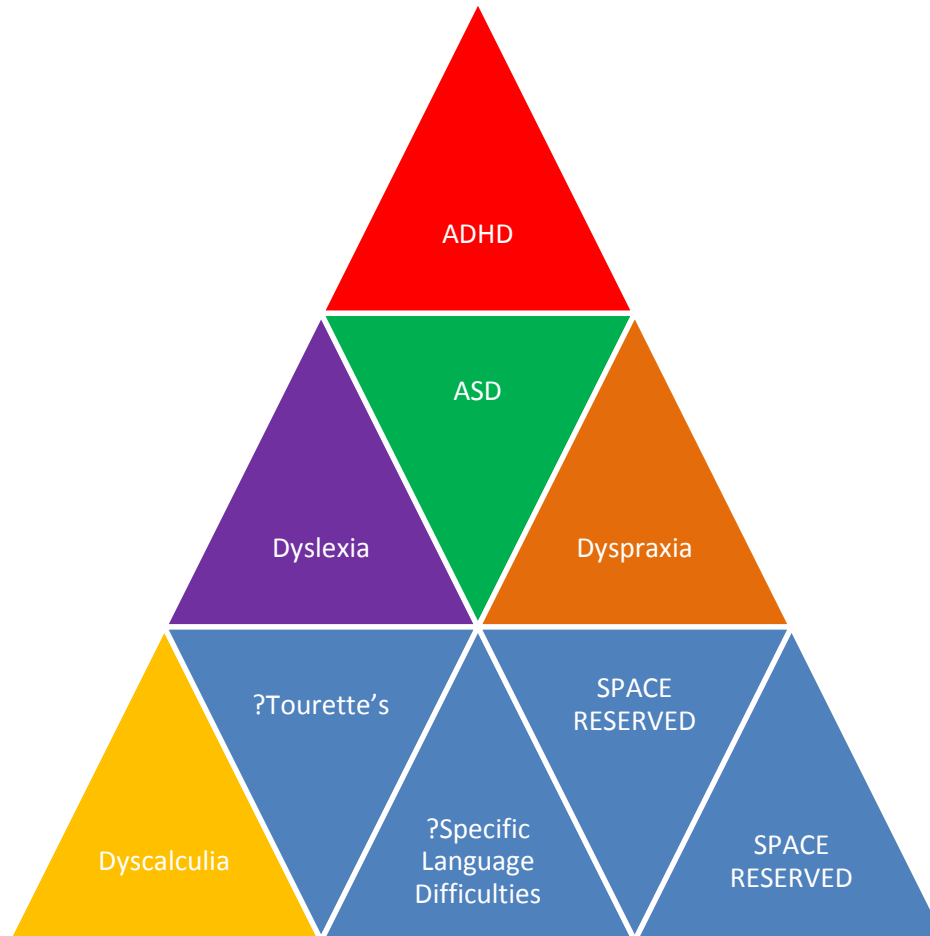
- What are Hidden Impairments and why are they discussed together?
- How does each one of them present and what adjustments can be made in the Higher Education system?
 - Definitions
 - Clinical presentation
 - Neuro-basis
 - Difficulties in education
 - Adjustments



Illness
model

Disability
model

Hidden Impairments



COMMON AREAS OF DIFFICULTY

- May need more time to digest information
- Information needs to be in different formats e.g. oral/ letter/ text
- May need extra time and practical assistance during appointment to find their way around/ fill in forms or even take a break
- May find it difficult to understand what is being requested of them
- May not be able to communicate their difficulties accurately and may need prompting
- May present anxious/ restless/ confrontational, in unfamiliar environments, may need time to calm down and may need to explain clearly what the process involves
- May not remember appointments – solutions e.g. text, email, post



Summary of studies

- DCD and ASD- Green et al,2002.Dewey et al,2007
- DCD and ADHD -Rasmussen and Gillberg,2000
- ADHD and ASD -Sinzig et al,2009
- ADHD and reading difficulties –August and Garfinkel,1990;Kadejso and Gillberg,2001
- ADHD , dyslexia and mathematic difficulties-Szatmariet *al*, 1989
- Language disorders and behaviour- Ripley and Yuill,2005
- Language disorders and dyslexia – Snowling et al,2000
- Language disorders and DCD- Hill et al.1998
- Tourette’s and ADHD-Shady, Rulton& Champion, 1988
- Emotional and behavioural difficulties and dyslexia, ADHD-Place et al,2000

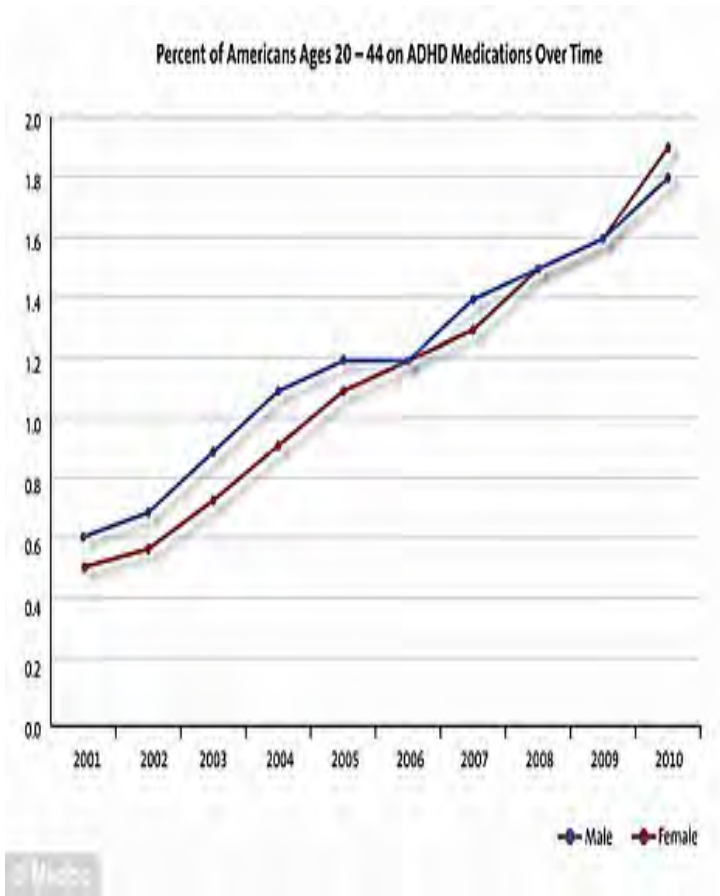
- Kaplan *et al.*, (1998) showed that in a population of children with DCD, ADHD, and dyslexia overlap occurred frequently, with nearly 25% of those with one developmental disorder found to have all three, 10% had both ADHD and DCD, and 22% had dyslexia and DCD.



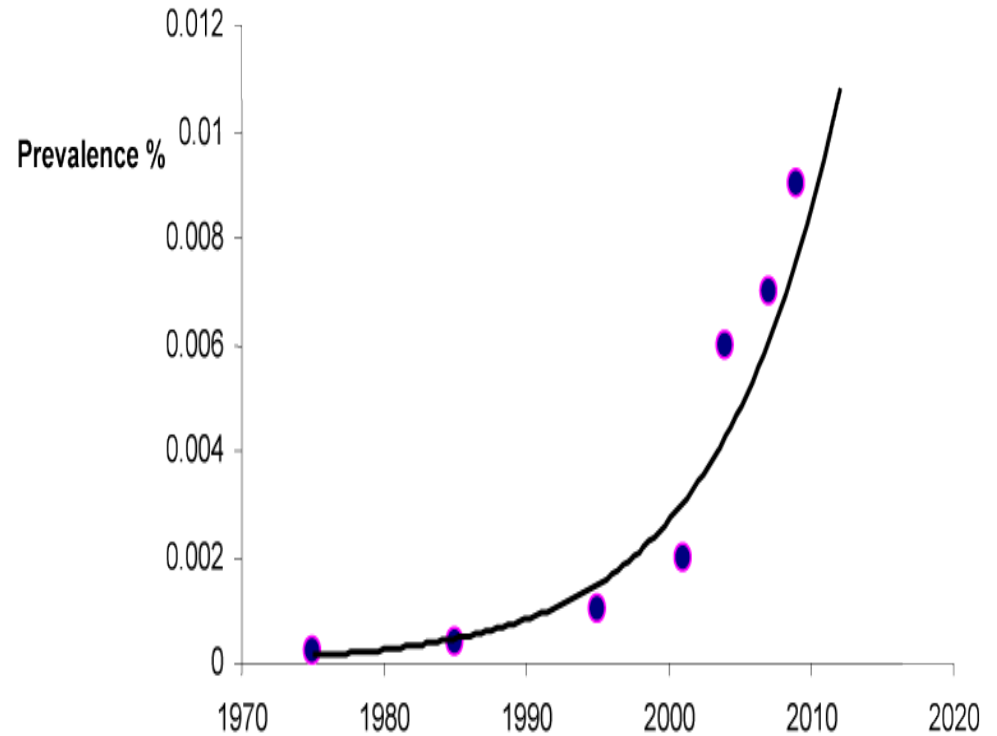
Hidden Depths



Increased incidence or recognition

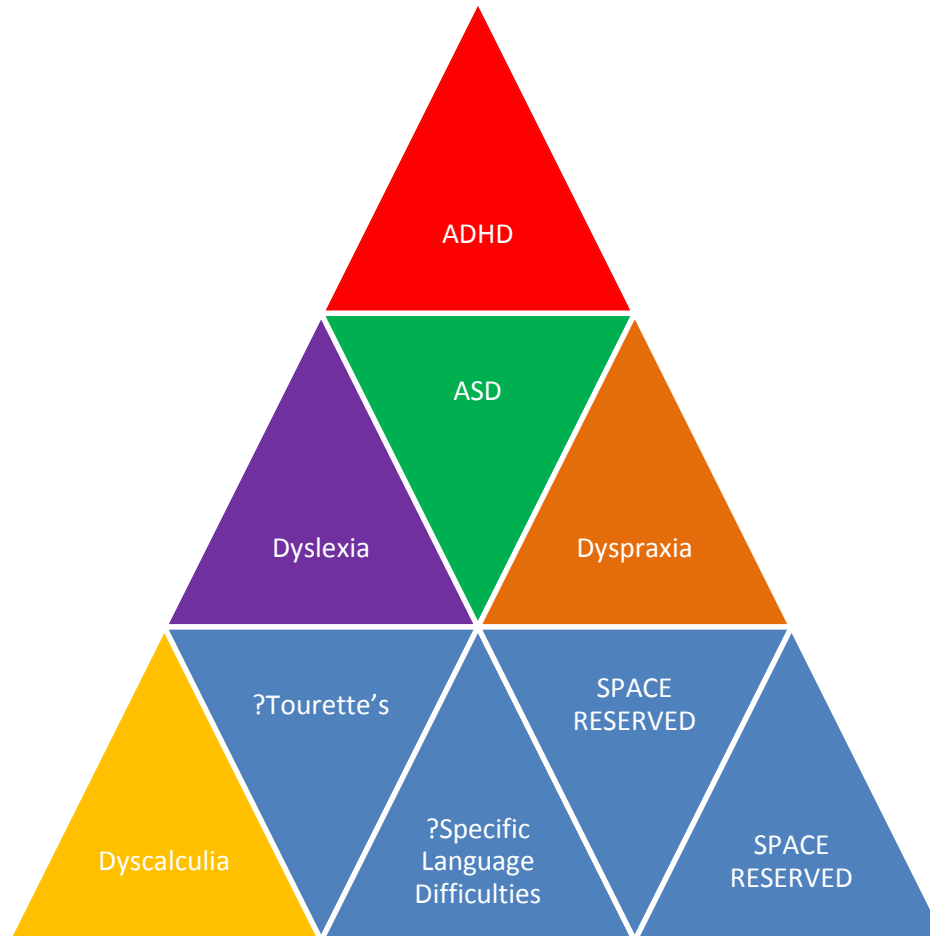


ADHD



ASD

Hidden Impairments



ADHD



ADHD

- ADHD affects around 1 – 2% of the population.
- ADHD is a neurodevelopmental disorder starting in childhood
- Until recently it was believed that children outgrew ADHD in adolescence. However, it is now known that the disorder can continue into adulthood.
- The definitions of ADHD are based on high levels of **impulsivity**, **hyperactivity** and **inattention** which cause difficulties at home, in education, in work and social settings.
- People with ADHD may *vary in how their symptoms present* depending on the level of demand on them and characteristics of the environment they are working in (e.g. levels of noise etc).

Brain Abnormalities in ADHD

- Total cerebrum is smaller by ~2-5% in children, not adults with ADHD
- Smaller PFC, especially DLPFC
- Anterior Cingulate + Cingulum Bundle
- Corpus Callosum - smaller in the anterior and posterior areas

ADHD

INATTENTION

Fails to give close attention to details or makes careless mistakes in schoolwork

Has difficulty sustaining attention in tasks or play activities

Does not seem to listen when spoken to directly

Does not follow through on instructions and fails to finish schoolwork, chores or duties

Has difficulty organising tasks and activities

Avoids tasks (e.g. schoolwork, homework) that requires sustained mental effort

Loses things necessary for tasks or activities (e.g. toys, school assignments, pencils or books)

Is easily distracted

Is forgetful in daily activities

HYPERACTIVITY/IMPULSIVITY

Fidgets with hands or feet or squirms in seat

Leaves seat in classroom or in other situation in which remaining seated is expected

Runs about or climbs excessively in situations in which it is inappropriate

Has difficulty playing or engaging in leisure activities quietly

Is "on the go" or acts as if "driven by a motor"

Talks excessively

Blurts out answers before questions have been completed

Has difficulty waiting turn

Interrupts or intrudes on others

Present from early in life, present to a severe degree most of the time, pervasive across situations and result in impairment

Prospective follow-up studies of ADHD

Study	n	Age range or mean at baseline	Diagnostic system		Age at follow-up	ADHD persistence	
			Recruitment	Follow-up		Mean	n
Mendelson <i>et al.</i> (1971)	83	9-9	DSM-II ^a	DSM-II ^a	13-4	42	50
Borland & Heckman (1976)	20	7-5	DSM-II ^a	DSM-II ^a	30-4	10	50*

Psychological Medicine, 2006, 36, 159–165. © 2005 Cambridge University Press
doi:10.1017/S003329170500471X First published online 3 May 2005. Printed in the United Kingdom

REVIEW ARTICLE

The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies

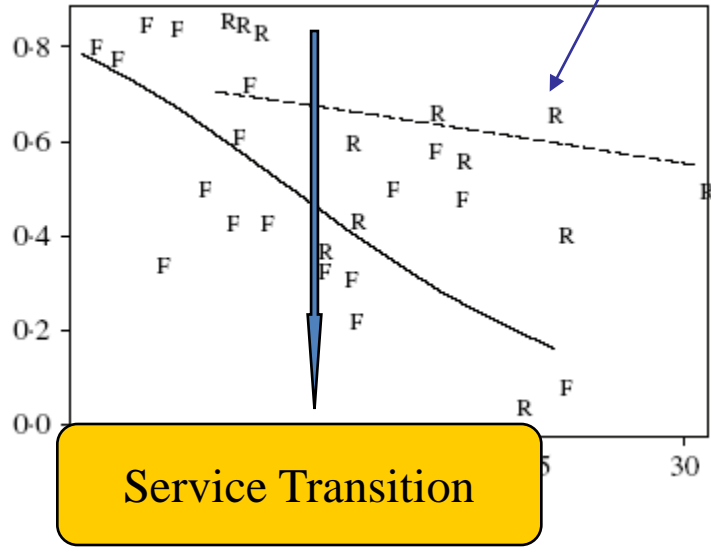
STEPHEN V. FARAONE^{1*}, JOSEPH BIEDERMAN^{2,3} AND ERIC MICK^{2,3}

Barv <i>et al.</i> (1995)	100	9-4	DSM-III ^b	DSM-III ^b	12-4	52	54
Claude & Firestone (1995)	52	7-3	DSM-III	DSM-III ^b	19-7	26	50
Biederman <i>et al.</i> (1996)	128	10-5	DSM-III ^b	DSM-III ^b	14-5	109	85*
Biederman <i>et al.</i> (1996)	128	10-5	DSM-III ^b	DSM-III ^b	14-5	78	61
Rasmussen & Gillberg (2000)	50	7	DSM-III ^c	DSM-IV	22	28	56*
Rasmussen & Gillberg (2000)	50	7	DSM-III ^c	DSM-IV	22	24	48
Yan (1996)	197	10-0	DSM-II ^a	DSM-III ^b ^d	25-5	140	70*

Full Diagnosis

Residual Diagnosis

Rates of Persistence



Developmental Impact of ADHD

Behavioural disturbance

Academic problems
Difficulty with social interactions
Self-esteem issues
Legal issues, smoking and injury

Occupational failure
Self-esteem issues
Relationship problems
Injury/accidents
Substance abuse

Pre-school

School-age

Adolescent

College-age

Adult

Behavioural disturbance
Academic problems
Difficulty with social interactions
Self-esteem issues

Academic failure
Occupational difficulties
Self-esteem issues
Substance abuse
Injury/accidents

Impact of Untreated and Under-treated ADHD

Health Care System

50% ↑ in bike accidents¹
33% ↑ in ER visits²
2-4X more motor vehicle crashes³⁻⁵

Patient

Family

3-5X ↑ Parental Divorce or Separation^{11,12}
2-4X ↑ Sibling Fights¹³

School & Occupation

46% Expelled⁶
35% Drop Out⁶
Lower Occupational Status⁷

Society

Substance Use Disorders:
2X Risk⁸
Earlier Onset⁹
Less Likely to Quit in Adulthood¹⁰

Employer

↑ Parental
↑ Absenteeism¹⁴
and
↓ Productivity¹⁴

1. DiScala et al. 1998

2. Liebson et al. 2001

3. NHTSA, 1997.

4-5. Barkley et al. 1993; 1996.

6. Barkley, et al. 1990.

7. Manuzza et al. 1997.

8. Biederman et al. 1997.

9. Pomerleau et al. 1995

10. Wilens et al. 1995.

11. Barkley et al. 1991.

12. Brown & Pacini, 1989.

13. Mash & Johnston, 1983.

14. Noe et al, 1999

Issues

Patient/Student Specific

- Diagnostic
- Performance
- Safety Issues
- Legal

Process Specific

- Job/university application
- Job/university interview
- Job/educational performance attainment

Job Performance

- Poor job performance
- Lower occupational status
- Less job stability
- Increased absence days in comparison to adults without ADHD (22.1 days of excess lost role performance)
- Fewer adults with clinically diagnosed ADHD were in paid employment (22–24 %) compared with population-derived controls (72–79 %)

Add education slide

Even children whose relatively low level of symptoms make them unlikely candidates for diagnosis will suffer significant ill effects (child

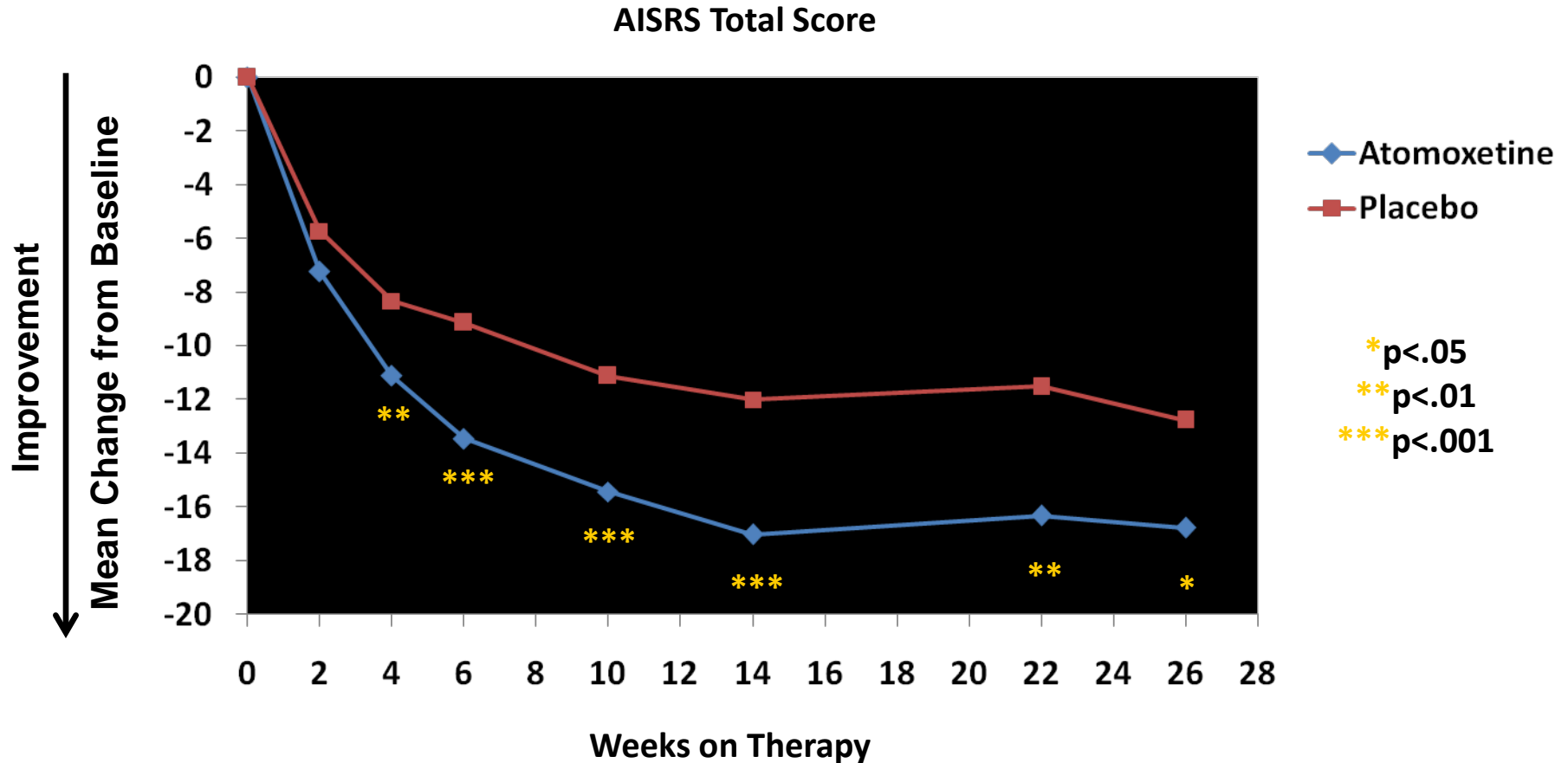
**Mental Health and Human Capital Accumulation: The Case of ADHD
Janet Currie, Mark Stabile NBER Working Paper No. 10435)**

Are you receiving treatment?



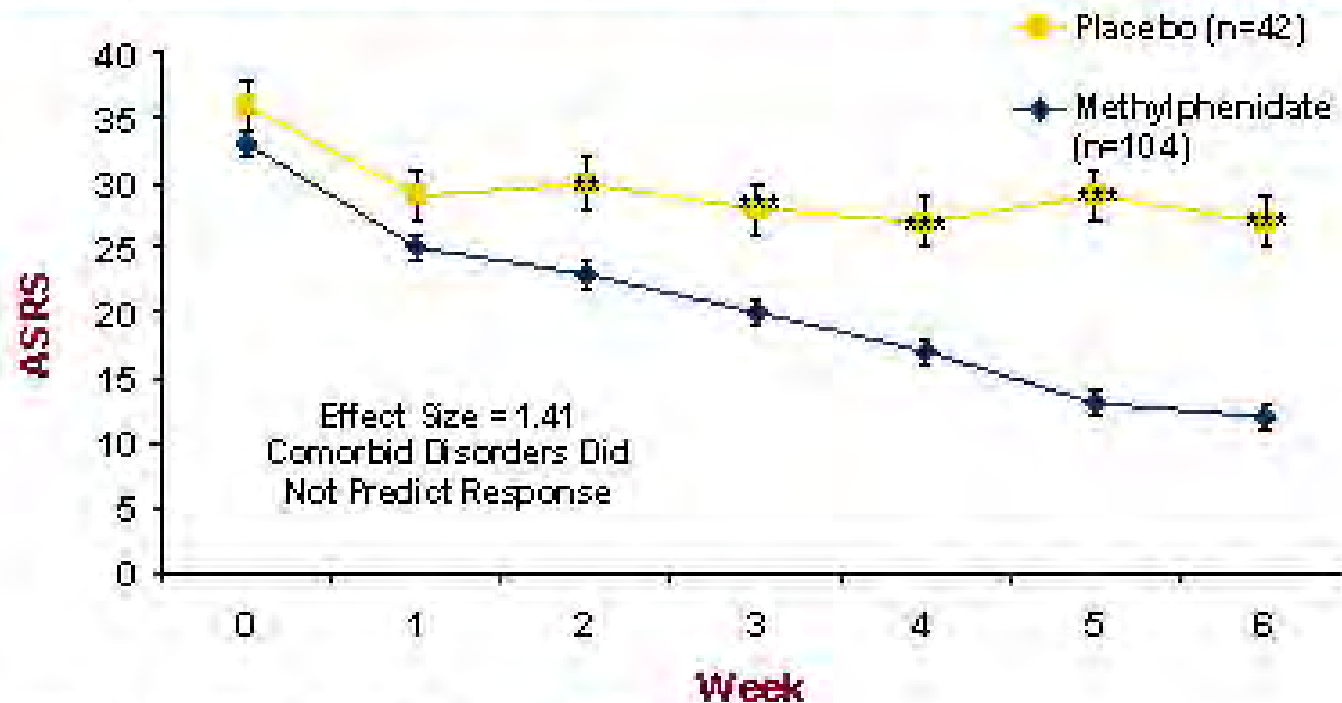
- Current and past medical treatment of ADHD was correlated with being in work.

Atomoxetine Efficacy in Adult ADHD: LYCU Study



Methylphenidate for Adult ADHD

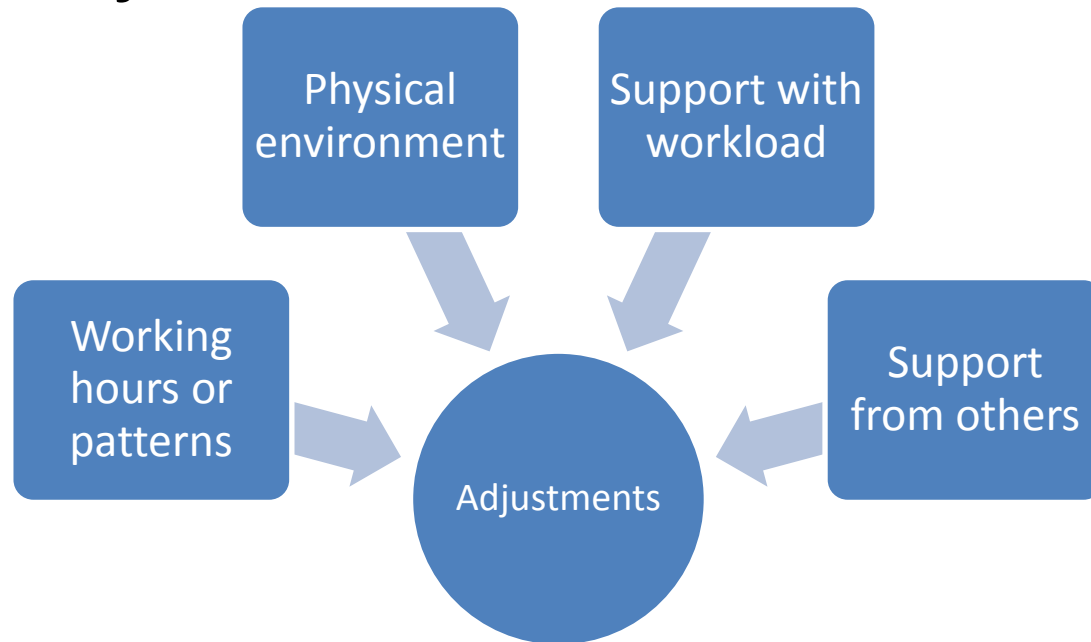
Improvement in Inattention and Hyperactive-Impulsive Symptoms



Spencer T, et al. *Biol Psychiatry*. 2005;57:456-463.

Adjustments

*A workplace adjustment is a change or adjustment **unique to a person's needs** that will enable them to do their job.*



CORRESPONDENCE

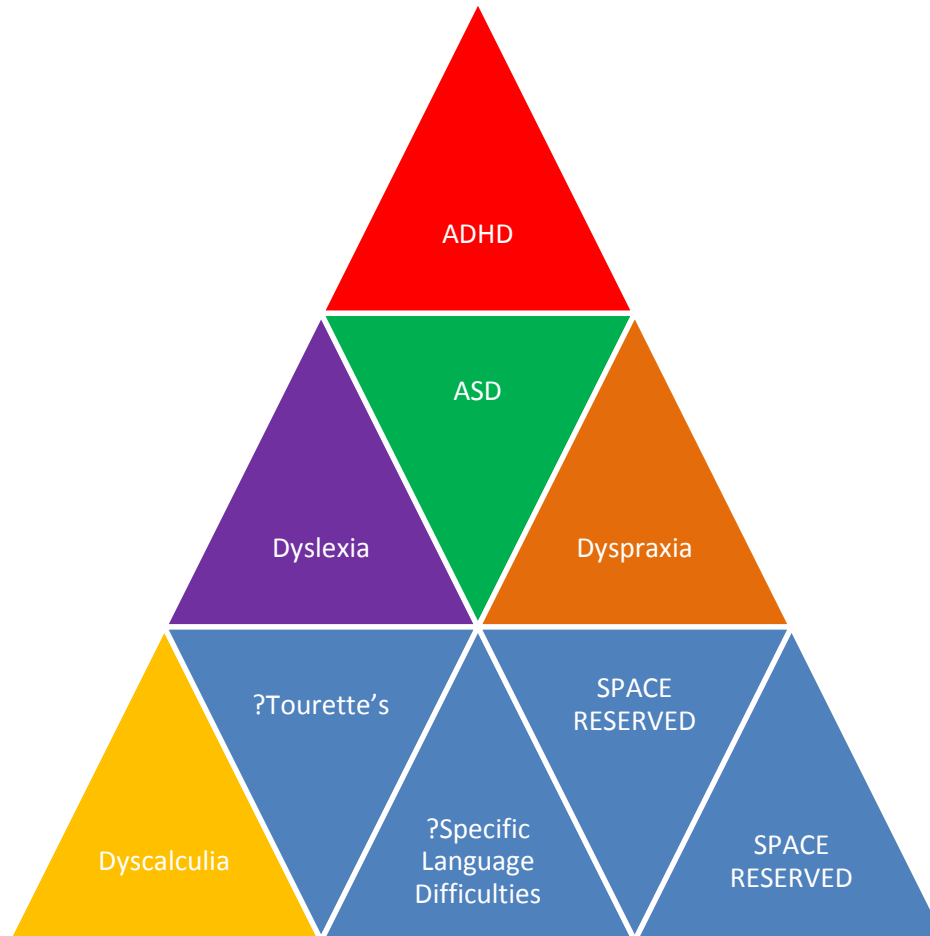
Open Access

Occupational issues of adults with ADHD

Marios Adamou^{1*}, Muhammad Arif², Philip Asherson³, Tar-Ching Aw⁴, Blanca Bolea⁵, David Coghil⁶, Gísli Guðjónsson³, Anne Halmøy⁷, Paul Hodgkins⁸, Ulrich Müller⁹, Mark Pitts¹⁰, Anna Trakoli¹¹, Nerys Williams¹² and Susan Young³

- Provide continued monitoring
- Arrange regular meetings
- Give constructive feedback
- Help structure tasks
- Set deadlines for all tasks
- Subdivide larger projects with deadlines
- Provide clear and structured training

Hidden Impairments



Autism Spectrum Conditions

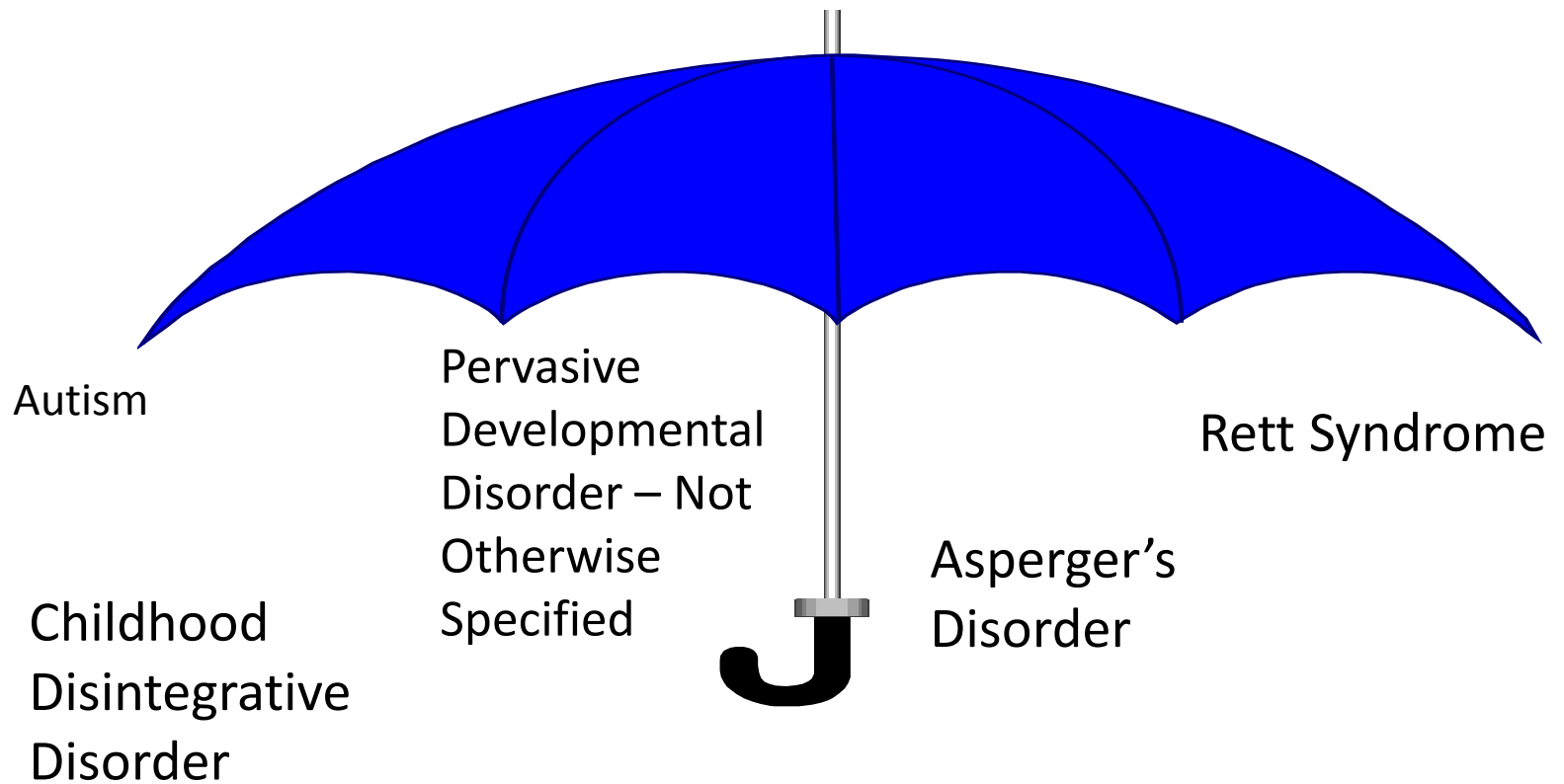


pe0059392 [RF] © www.visualphotos.com

Autism

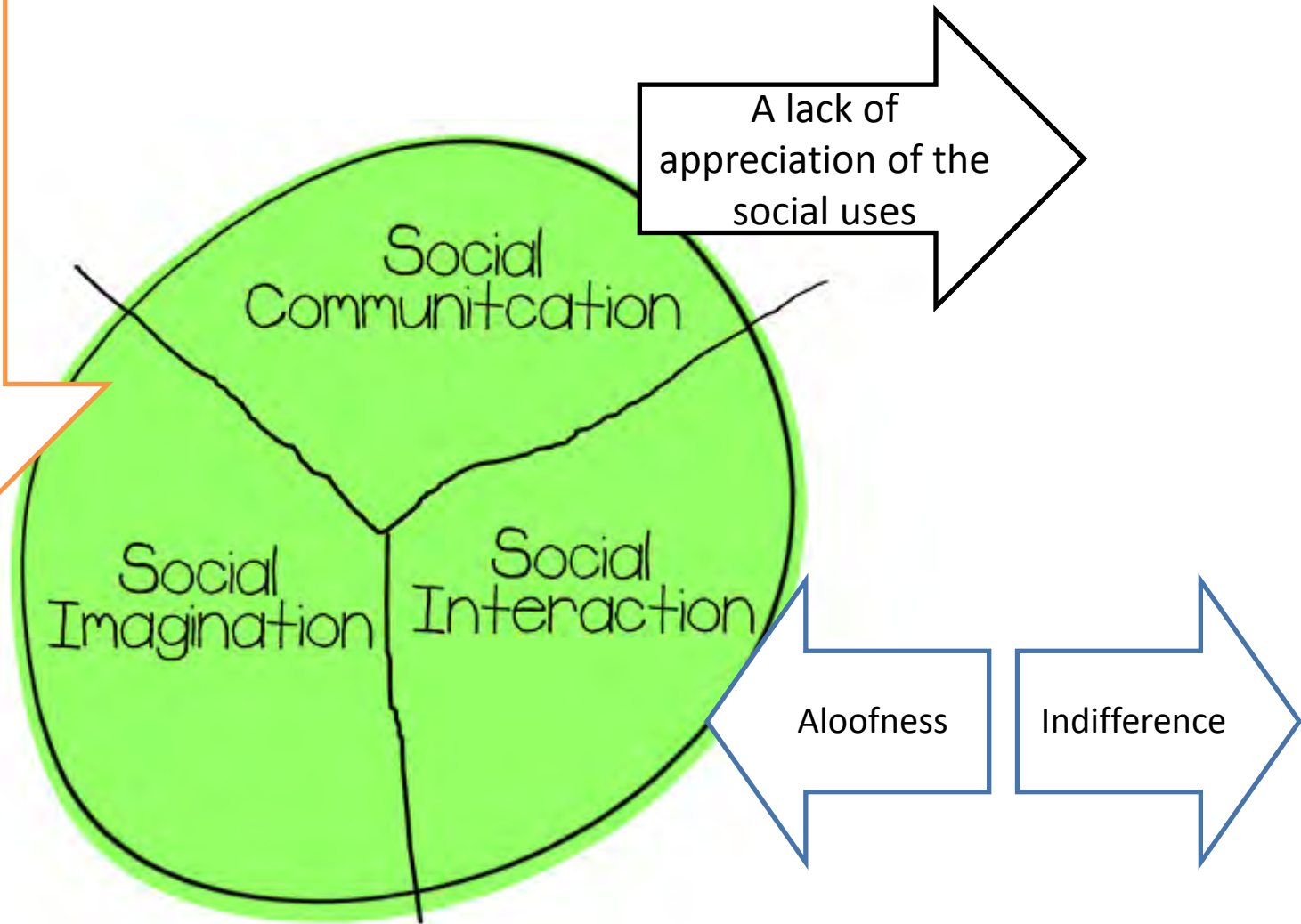
- It is estimated that half a million adults in the UK have an Autistic Spectrum Condition (ASC).
- It is a condition that affects how a person communicates with, and relates to, other people.
- The 'spectrum' element of the condition means that while all people with ASCs share certain difficulties, their condition will affect them in different ways and to varying degrees.
- Four times as many are men 4:1

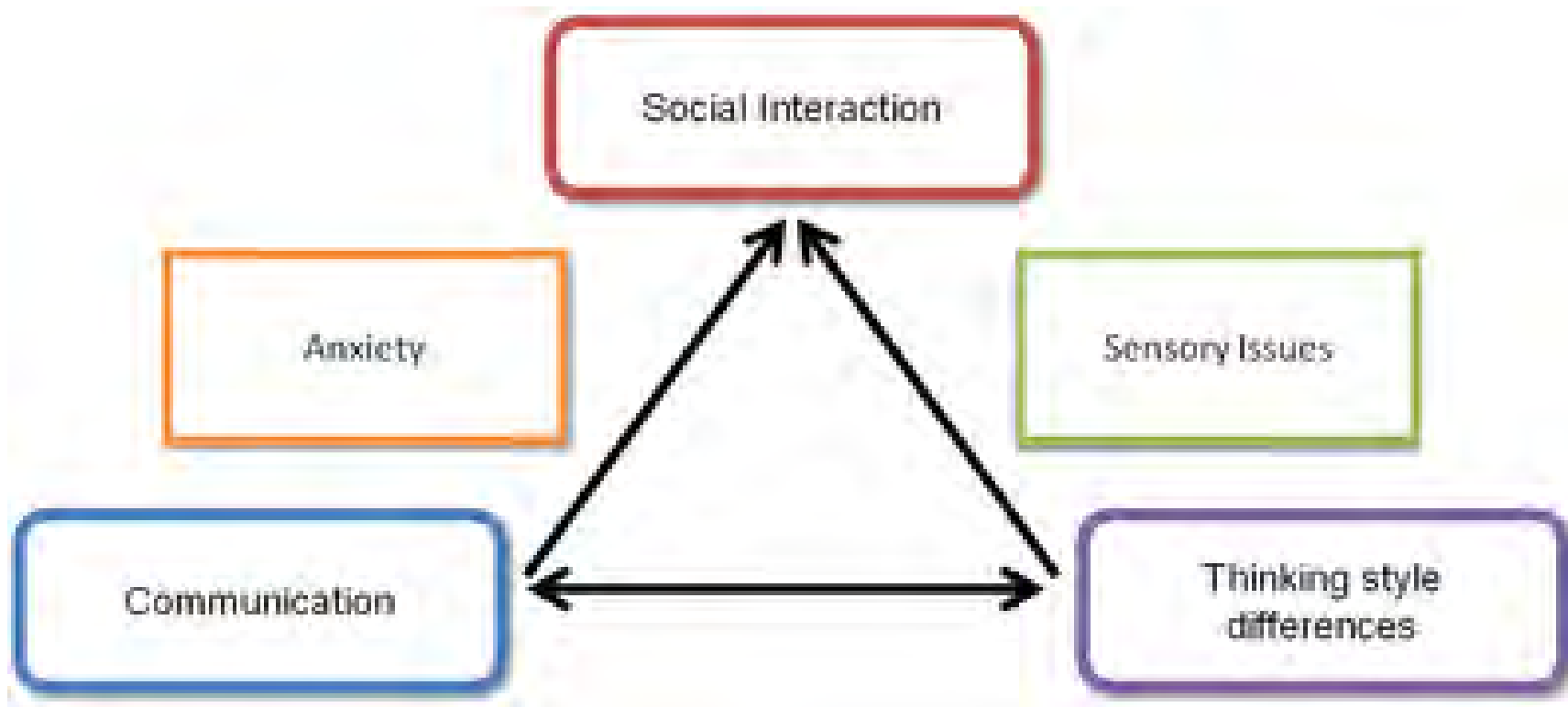
Pervasive Developmental Disorders (DSM-IV, 1994)



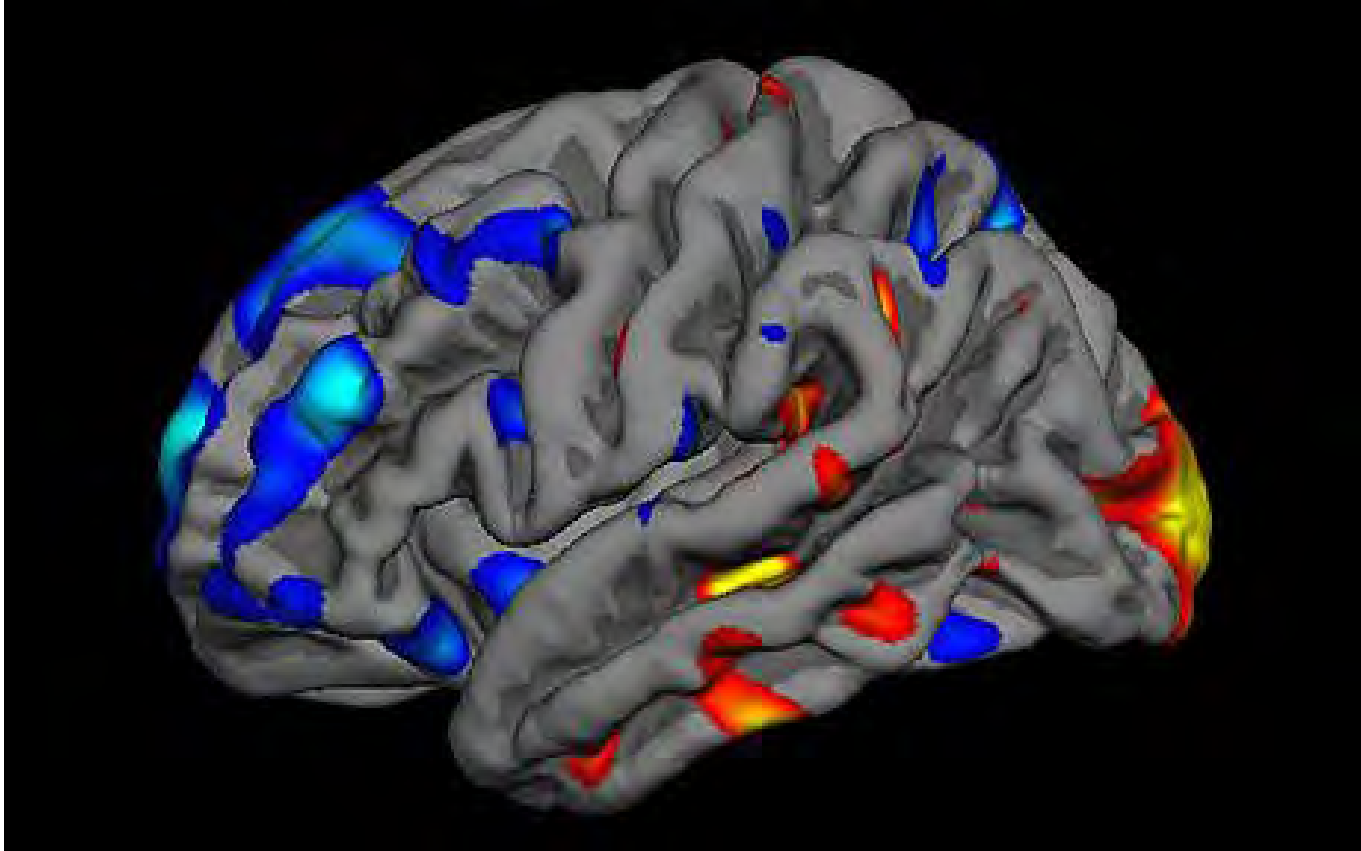
Triad of Impairments

very narrow range of repetitive activities or special interest





Autism



Areas of corpus callosum, cingulum, and aspects of the temporal lobe (Diffusion Tensor Imaging in Autism Spectrum Disorder: A Review *Travers et al* 2012)

Social Interaction

- Understanding acceptable behaviour
- Not always aware of others feelings
- Understanding emotions
- Understanding and explaining needs of self and others
- Meeting new people
- Withdrawal from new or intimidating situations
- Overly friendly or overly shy
- Inappropriate gestures during conversations.
- Feeling confident asking questions or for help
 - may appear anxious

Social Communication

- Use of excellent language skills
- Repetitive speech
- Formal speech
- Understanding when to end conversations
- Understanding humour
- Literal approach to communication
- Inappropriate use of body language
- Limited facial expressions/ reactions.
- Inappropriate level of eye contact

Social Imagination

- Obsession/ ritualistic behaviour/ routines
- Limited range of interests
- Solving ambiguous problems
- Abstract thought
- Dealing with change both personal and environmental
- Fondness of routine and structure
- Inability to link transferable skills.
- Understanding social codes e.g. dress

Issues

Patient/Student Specific

- Diagnostic
- Performance
- Safety Issues
- Legal

Process Specific

- Job/university application
- Job/university interview
- Job/educational performance attainment

Legal

- that the Government produce an adult autism strategy by 1 April 2010
- that the Secretary of State for Health issue statutory guidance for local authorities and local health bodies on supporting the needs of adults with autism by 31 December 2010.



Autism Act 2009

Diagnostic

NHS
National Institute for
Health and Clinical Excellence

Autism: recognition, referral, diagnosis and management of adults on the autism spectrum

Issued: June 2012

NICE clinical guideline 142
guidance.nice.org.uk/ig142



EXPERT

Only 15% of
people with
autism in
employment

NHS Evidence has accredited the process used by the Centre for Clinical Practice at NICE to produce guidelines. Accreditation is valid for 5 years from September 2008 and applies to guidelines produced since April 2007 using the processes described in NICE's 'The guidelines manual' (2007, updated 2008). More information on accreditation can be viewed at www.nhs.uk/nhs.uk

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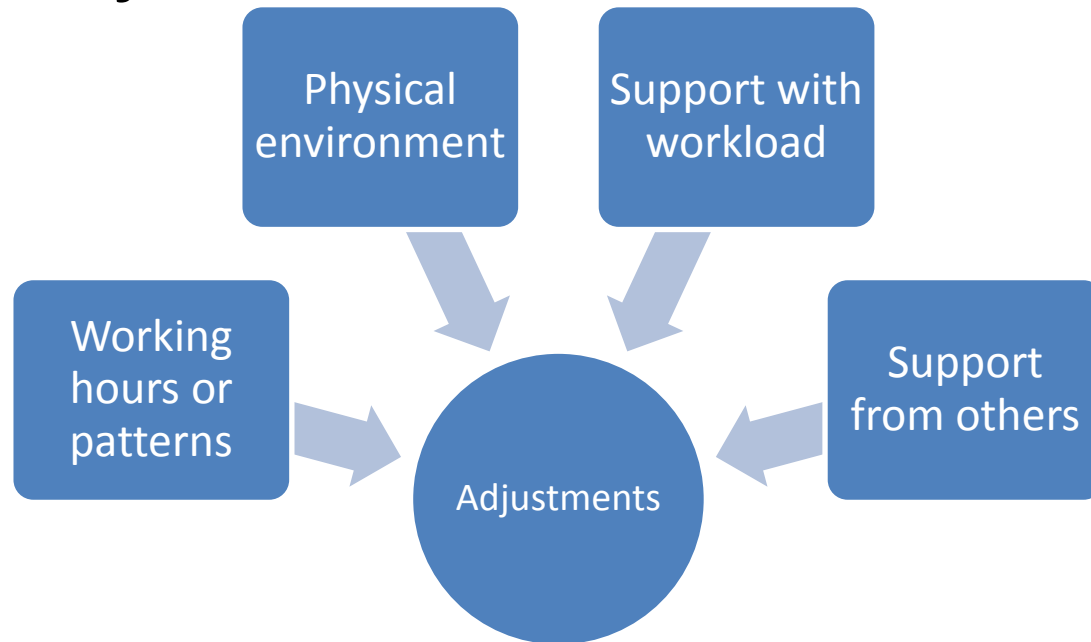


Where did you receive a diagnosis?



Adjustments

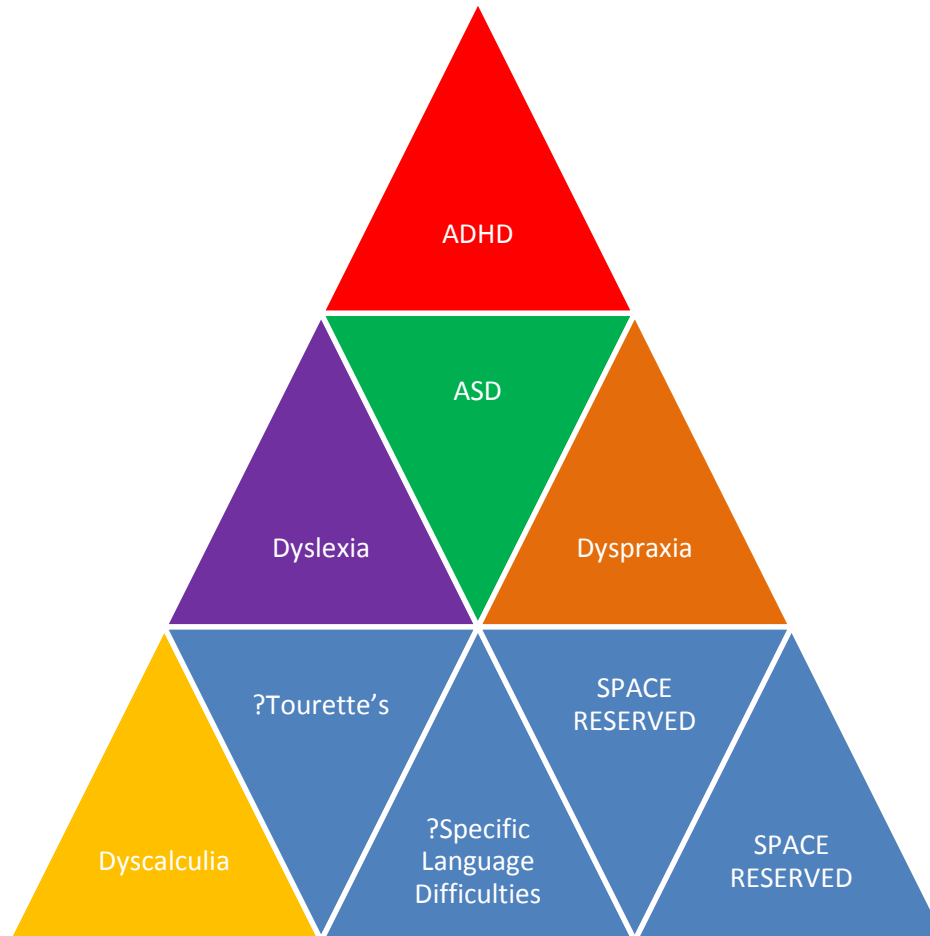
*A workplace adjustment is a change or adjustment **unique to a person's needs** that will enable them to do their job.*



Criteria for appropriate education

- Specialized curriculum content
- Classroom support
- Specialized teaching methods
- Coordinated team approach
- Modifying the environment
- Supports and services for students and families
- Structured learning environments
- Collaboration with home-schooling where required
- Functional approach to problem behaviour
- Involvement of the parents
- Social support and positive attitude by all involved
- Recurrent evaluation of inclusion procedures.

Hidden Impairments



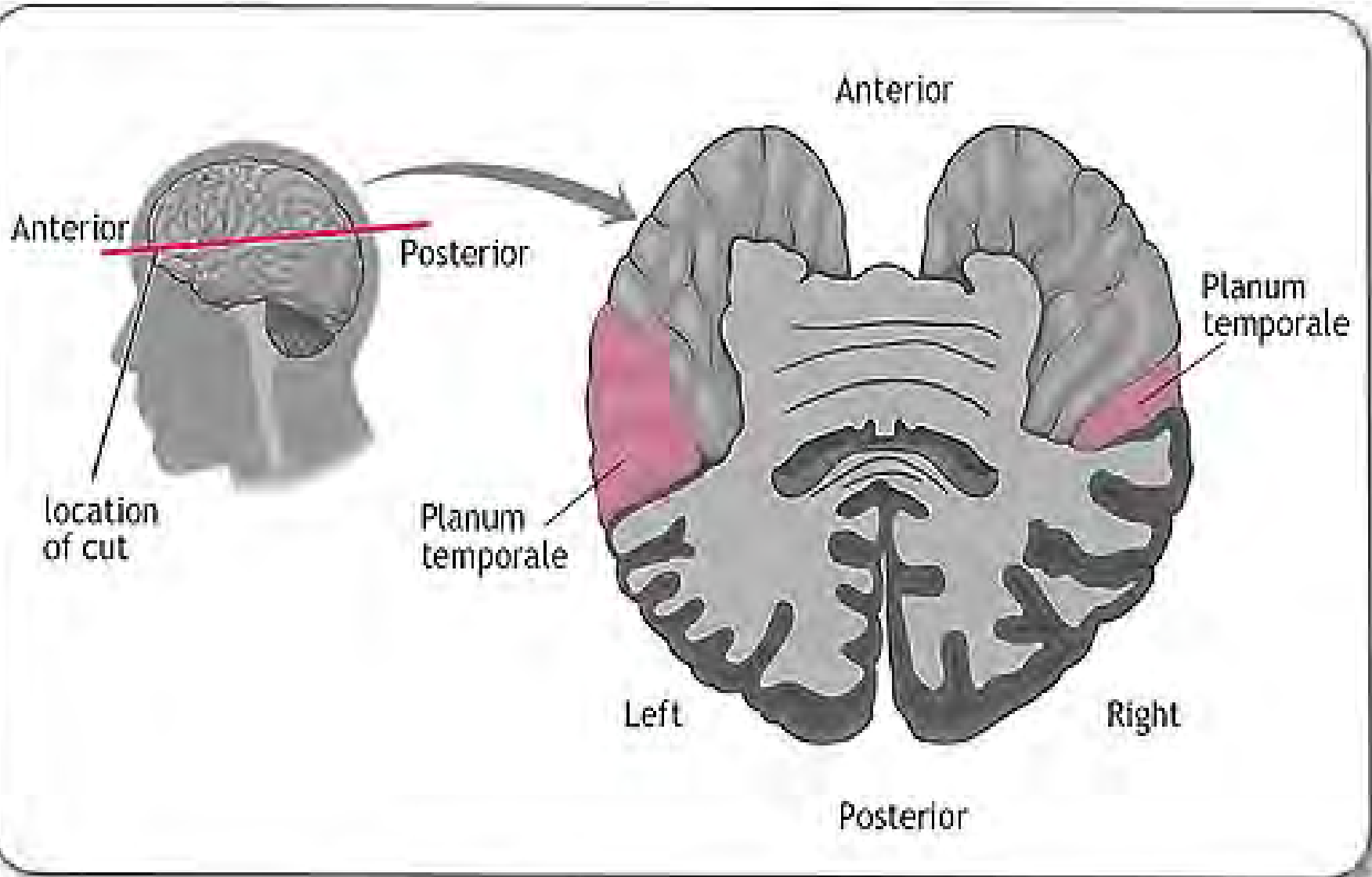
Dyslexia

- Dyslexia is a learning difficulty characterised by specific problems in **learning to read, write and spell**, despite sufficient educational experience.
- Estimates of prevalence vary, from 2% to 15% of the population.
- The prevalence of dyslexia is higher in English speakers than in speakers of many other languages.
- Three or four males may be affected for every female (James, 1992)
- Involves a general deficit in relating the spoken or heard form of a word to its visual form.

Dyslexia

- The number of students with dyslexia entering higher education has increased during recent years from 0.74% of all students entering higher education in 1994 to **1.00%** in 1996 (Dearing, 1997)
- Taken as a group, students with dyslexia represent the **largest disability category in higher education**, and many of these are identified after entry (FHEA)

Dyslexia



Areas of difficulty

- Reading
- note taking in meetings
- writing and structuring documents
- remembering instructions
- copying notes
- learning new vocabulary
- remembering instructions
- spelling and reading speed.

Issues

Patient/Student Specific

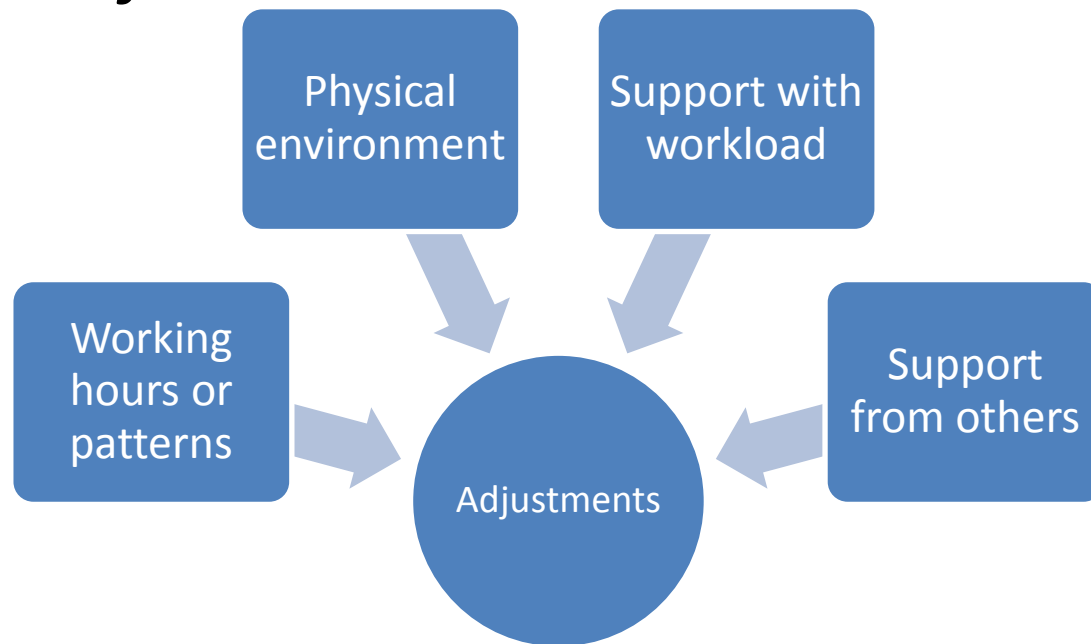
- Diagnostic
- Performance
- Safety Issues
- Legal

Process Specific

- Job/university application
- Job/university interview
- Job/educational performance attainment

Adjustments

*A workplace adjustment is a change or adjustment **unique to a person's needs** that will enable them to do their job.*



Support

- Self Help
- General Academic Support
- Accessible Course Materials
- Assessment Issues

Self Help

- the use of mind maps for planning
- highlighting key points on texts
- developing information searching skills to select relevant extracts
- keeping a dictionary of key words
- approaching a topic through a variety of media
- developing strong peer support
- revise little and often, well in advance
- construct timetables to assist organisation
- keep a diary for forward planning and reflection
- use a word processor and spell checker
- avoid overloading study time (Access Summit, 1999)

Academic Support

- Making sure that the student is aware of the wider institutional support that is available.
- Providing lecture notes/overheads in advance of lectures, in a format which is accessible to them.
- Using demonstration analogies and 'real life' examples to explain theories.
- Speaking with the individual student to ascertain where his or her particular difficulties and strengths lie, and what support (if any) they will require the academic tutor (the individual characteristics of dyslexia require individual support, what proves good practice for one student may not be helpful to another).
- Most importantly, be understanding and sensitive to the student who may be experiencing lack of confidence and low self esteem as a result of their dyslexia.

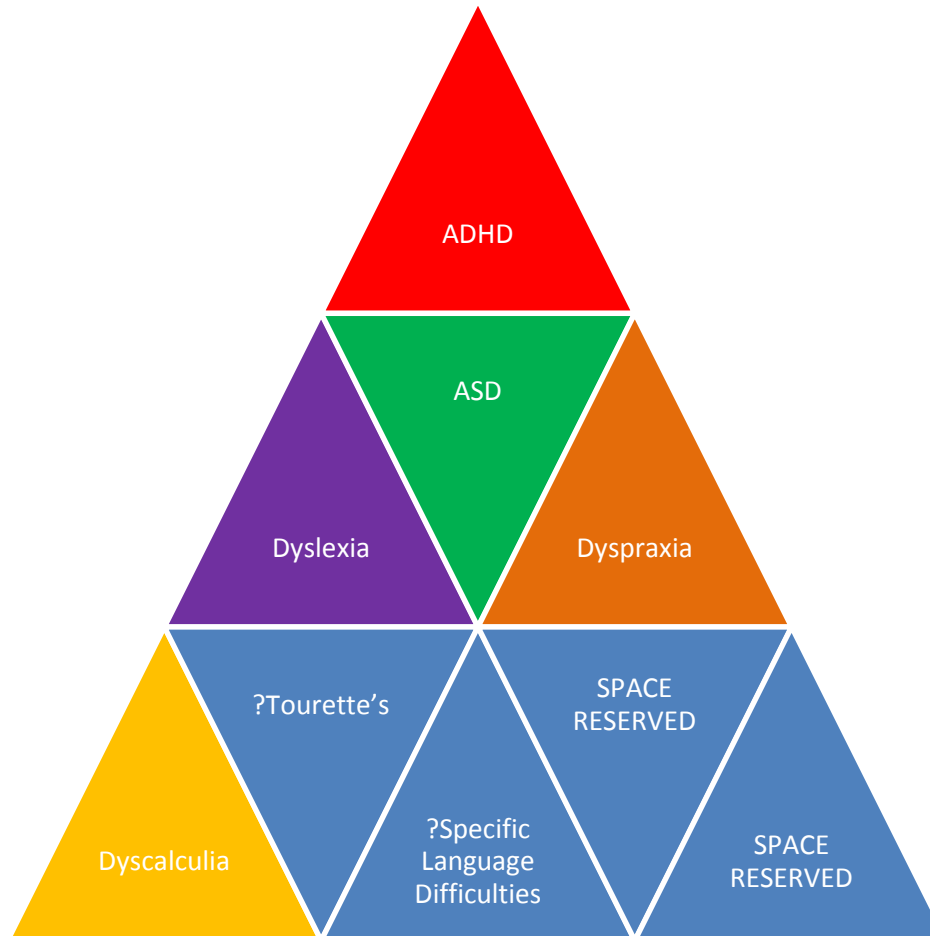
Accessible Course Materials

- Short simple sentences. Shorter documents
- 12+ sans serif fonts. Arial is preferred, avoid fancy fonts, (italics are particularly difficult for a reader with dyslexia).
- Justified to the left only, ragged right edges (this makes it easier to follow the text).
- Numbered bullet points rather than continuous prose.
- Boxed and indented sections to break up the text.
- Wider spacing between characters, words, lines and paragraphs.
- Plenty of headings.
- Embolding, coloured text for highlighting.
- Coloured paper (cream)

Assessment Issues

- If possible, provide oral assessment opportunities.
- Do not correct every spelling mistake.
- Try to mark positively, ticking correctly structured sections and praising good points.
- Avoid making negative comments such as "please use the spell checker." The student is probably already making extensive use of the spell checker, although they are likely choosing the wrong options.
- If time permits, allow the student to produce a draft version.

Hidden Impairments

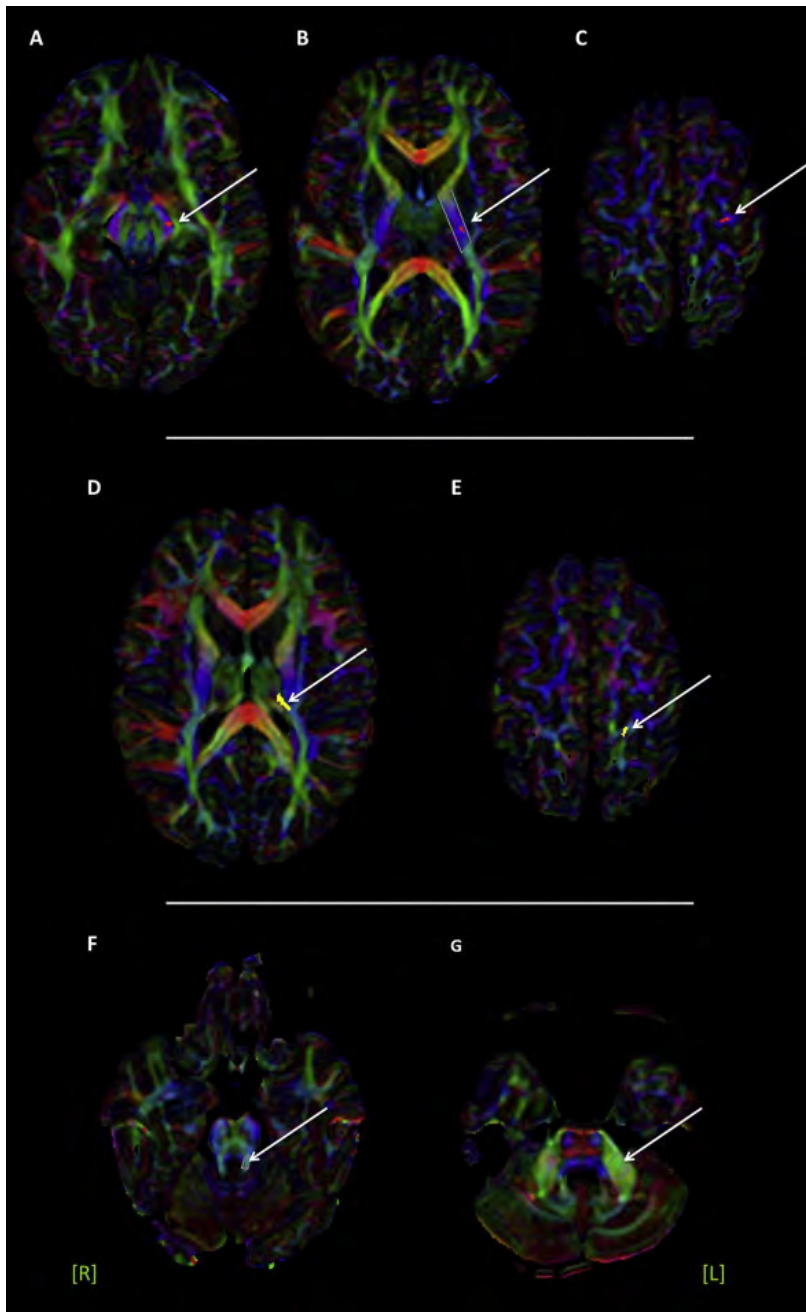


Dyspraxia

- Dyspraxia, also known as Developmental Co-ordination Disorder (DCD) is a common disorder affecting motor co-ordination in 5-6% of children of which 70% continue to experience some level of associated difficulties in adulthood.
- Is distinct from other motor disorders such as cerebral palsy and stroke.
- The range of intellectual ability is in line with the general population.

Types of dyspraxia

- Inability to carry out a motor command, for example (Ideomotor)
- Inability to create a plan for or idea of a specific movement (Ideational)
- Inability to make fine, precise movements with a limb (Limb-kinetic)
- Difficulty planning the movements necessary for speech (Verbal), also known as Apraxia of Speech
- Inability to draw or construct simple configurations (Constructional),
- Difficulty moving the eyes (Oculomotor).



Children with DCD activate different brain regions from typical children when performing the same trail-tracing task.

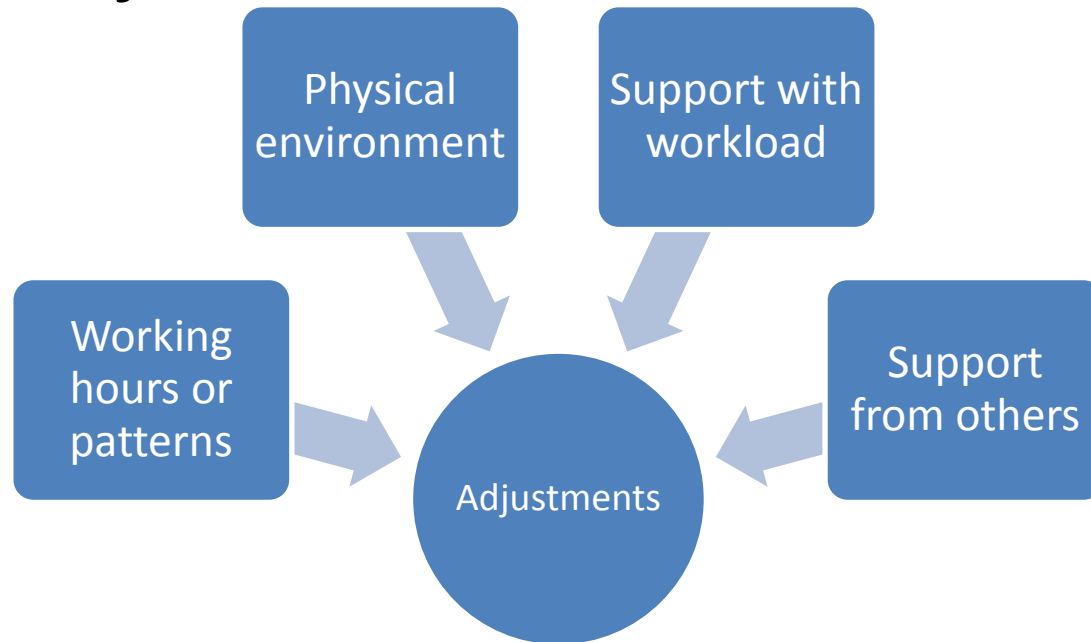
Developmental Coordination Disorder: A Pilot Diffusion Tensor Imaging Study *Pediatric Neurology*, Volume 46, Issue 3, March 2012, Pages 162-167

Areas of difficulty

- Skills requiring balance
- Everyday life skills e.g. handwriting, dressing, driving a car
- Spatial awareness e.g. working at heights or judging distances
- Time management, planning and prioritising
- Taking information down at speed
- Managing responses to social situations
e.g. emotional/ behavioural
- Memory recall/ retention
- Slower learning a new skill requiring speed and accuracy

Adjustments

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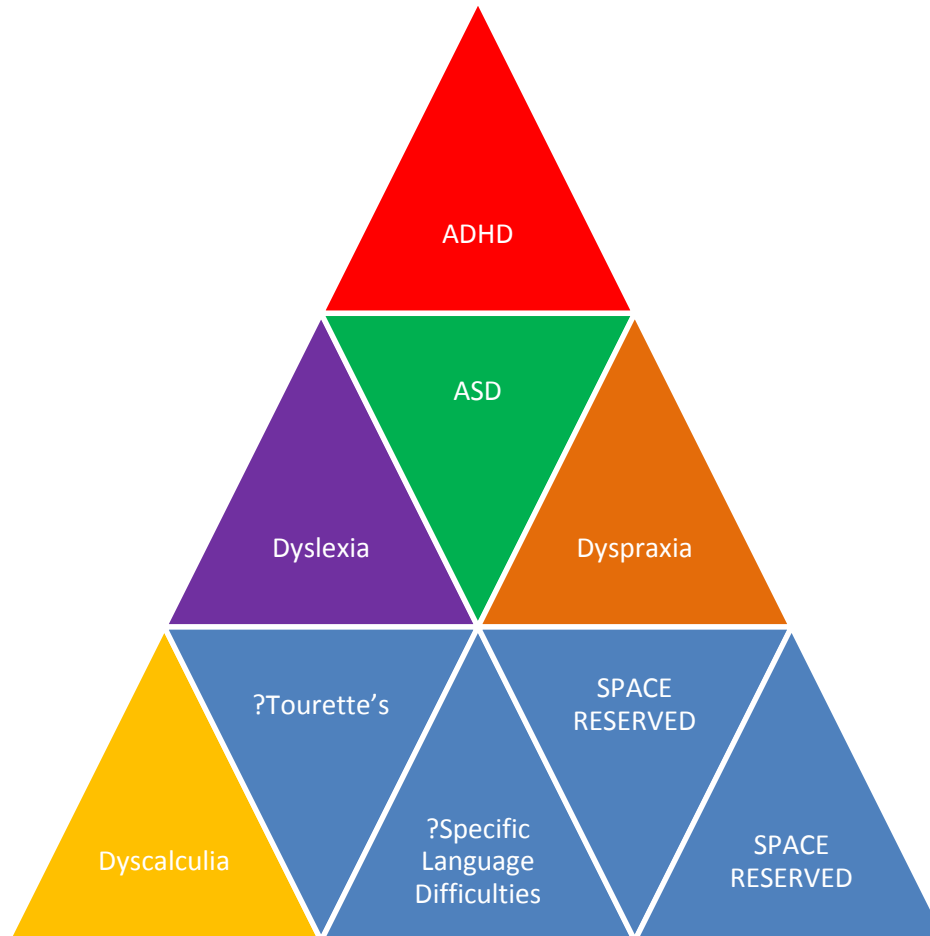


Adjustments

- Formal tuition in the planning and organisation of work, both practical and academic. Give examples of essays, reports and projects. Break down processes to steps with an opportunity for feedback to check understanding.
- Strategies to compensate for poor memory and organisational skills, e.g. the use of mnemonics, work timetables, flow charts and mind maps, hand-outs (preferably in large print) from lectures
- Computer hardware is very important e.g. laptops for note-taking and ergonomic keyboards and mice and large computer screens can make a great difference.
- Computer Software that is used for the dyslexic can also be very helpful such as *texthelp* and planning software such as *mindmanager*.
- A digital mini-disk recorder is important to record lectures and seminars.
- An extra allowance for photocopying is also necessary.

DANDA: Developmental Adult Neuro-Diversity Association

Hidden Impairments



Dyscalculia

- People with dyscalculia have specific problems in learning arithmetical concepts and procedures, despite sufficient educational experience and normal intelligence.
- The best prevalence estimates for dyscalculia lie between 1% and 7%.
- Genetic (Turner's syndrome, Fragile X syndrome, Velocardiofacial syndrome, Williams syndrome)
- Environmental causes (alcohol)

Dyscalculia

- Left inferior parietal lobule plays an important role in mental calculation (Henschen, 1919; Gerstmann, 1940).
- Bilateral intraparietal region is the main active area during simple arithmetic.
- Bilateral intraparietal, precentral, dorsolateral and superior prefrontal regions showed greater activation during **approximation**, while the left inferior prefrontal cortex and the bilateral angular regions were more activated during **exact calculation**.

Areas of difficulty

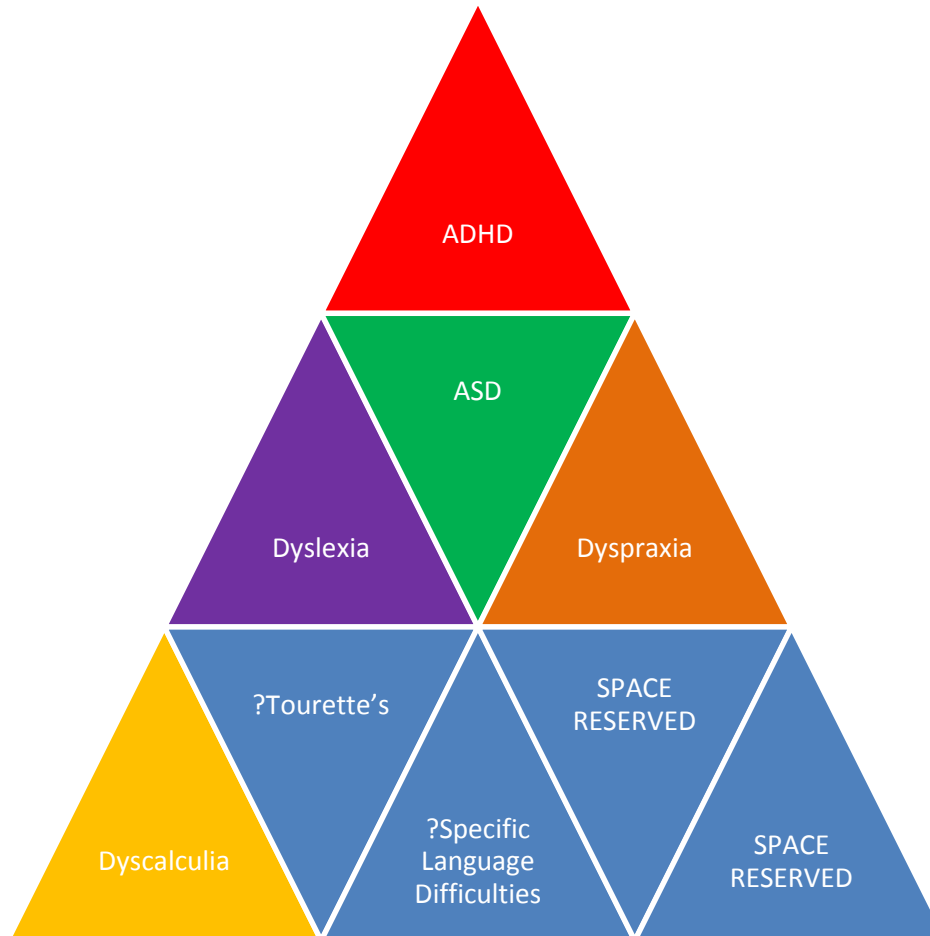
- May present with difficulties managing money
- Telling the time
- Taking measurements
- Learning and recalling times table
- Confusion with maths symbols
- Unable to estimate an answer
- Misunderstanding place value
- Lack understanding of mathematical vocabulary
- Cannot recognise inverse operations
- Being able to use more than one operation in a task
- Finding any form of sequencing too challenging

“Dyscalculic students have a low level of numerical or mathematical competence compared to expectation. This expectation being based on unimpaired cognitive and language abilities and occurring within the normal range. The deficit will severely impede their academic progress or daily living.

Support

Personalized learning applications developed by educational scientists can be targeted to remediate these deficits and can be implemented on handheld devices for independent learning

Hidden Impairments



Objectives

- What are Hidden Impairments and why are they discussed together?
- How does each one of them present and what adjustments can be made in the Higher Education system?
 - Definitions
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 - Difficulties in education
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