

# DCD/Dyspraxia

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# Aims of the talk

- Recap on: What is DCD
- Discuss present challenges
- Diagnostic Assessment for DCD/Dyspraxia

# Developmental Co-ordination Disorder

Latest European Guidelines (2018)

**First time an adult section**

# Guidelines for clinical practice

- **European/International DCD Guidelines (2017/18)**
- **UK Guidelines (2018)**

## International recommendations on DCD, Revision 2016

### Preliminary notes:

I. The recommendations included in this document concern individuals with DCD across the life-span. Since professionals working with children and adults tend to be located in different settings, are often governed by different legal regulations, and are influenced by different cultural factors, the following guidelines are presented in two separate sections:

- (i) children
- (ii) adolescents and adults.

Some repetition is therefore inevitable.

II. The current classification schemes referred to in this document, DSM 5 and ICD 10, use different terminology to describe the population of concern. For simplicity, the ICD term Specific Developmental Disorder of Motor Functions (SDDMF) is used only once. Thereafter, the term Developmental Coordination Disorder (DCD) is used throughout all sections.

III. The fact that developmental disorders frequently overlap and co-occur is referred to throughout this document. Where overlap is mentioned, we do not provide an exhaustive list of possible childhood disorders. Instead, the list is varied from time to time.

- I. The acquisition and execution of coordinated motor skills is substantially below that expected given the individual's chronological age and sufficient opportunities to acquire age-appropriate motor skills.
- II. The motor skills deficit described in criterion I significantly and persistently interferes with the activities of everyday living appropriate to chronological age (e.g., self-care, self-maintenance and mobility) and impacts upon academic productivity, pre-vocational and vocational activities, leisure, and work.
- III. The motor skills deficits are not better accounted for by any other medical, neurodevelopmental, psychological, social condition or cultural background.
- IV. Onset of symptoms in childhood (although not always identified until adolescence or adulthood).

## DSM-V (American Psychiatric Association)

Developmental Coordination Disorder (DCD), also known as Dyspraxia in the UK, is a common disorder affecting movement and coordination in children, young people and adults.

DCD is distinct from other motor disorders such as Cerebral Palsy and stroke, and occurs across the range of intellectual abilities.

This **lifelong** condition is formally recognised by international organisations including the World Health Organisation.

The person's coordination difficulties will **affect functioning in everyday activities** including in the classroom, at work and in leisure activities.

There may differences in how the person learns new skills at home and in education, work and in leisure activities.

Difficulties may vary in their presentation and will also change depending on environmental demands, life experience, and the support provided.

Many of the movement and coordination difficulties will continue into adolescence and adulthood.

Although the motor difficulties persist throughout life, non-motor difficulties may become more prominent as expectations and demands change over time.

There are a range of co-occurring non-motor difficulties which can have a substantial adverse impact on daily life. These may include social and emotional difficulties as well as problems with time management, planning and personal organisation, and these may also affect a person's education or employment experiences.

However, with appropriate recognition, reasonable adjustments and support, people with DCD can be very successful in their lives.

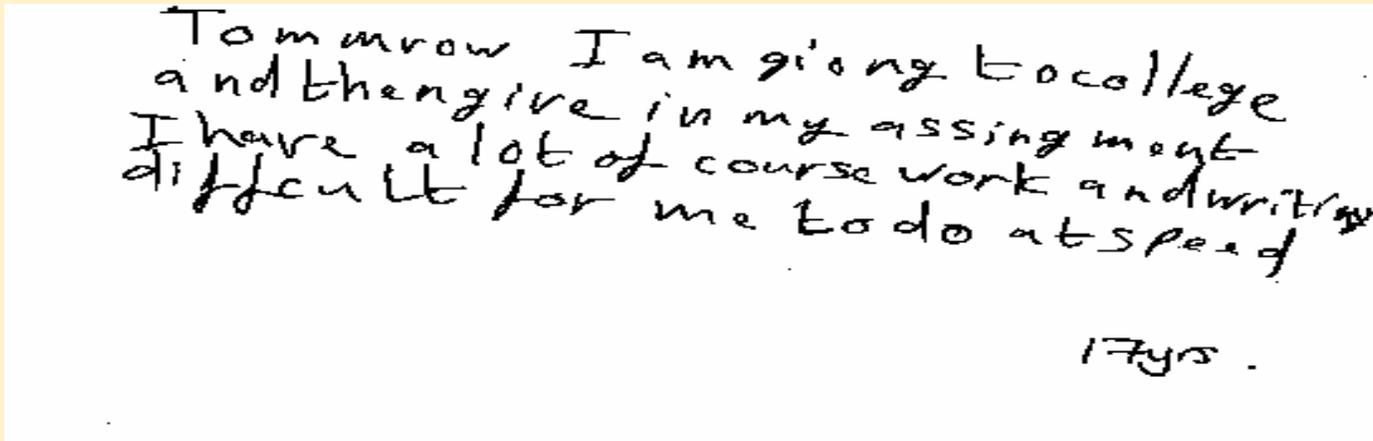
# Predicting **P**ersistence of DCD from child to adulthood

- **Severity of motor difficulties** in childhood (Cantell et al, 2003)
- **Level of co-occurrence** of other developmental disorders
- **Low self esteem** (Ring et al,2011)
- **Frustration** (Beeselo-Baum et al,2009)
- **Negative peer relationships** ( La Greca and Hanson,2005)
- **Low peer acceptance** (Tilfors et al, 2012)
- **Low social competence** ( Miers et al, 2013)
- **? Lack of risk taking opportunities**

# 3 key aspects of DCD



# Motor is the core



Tomorrow I am going to college  
and then give in my assignment  
I have a lot of course work and writing  
difficult for me to do at speed  
17 yrs.

Handwriting

Learning to drive

Playing sports e.g. team  
games

Learning new skills at  
speed and with accuracy

1 in 2 with DCD stated [handwriting](#) specifically as a  
continuing

# Non Motor

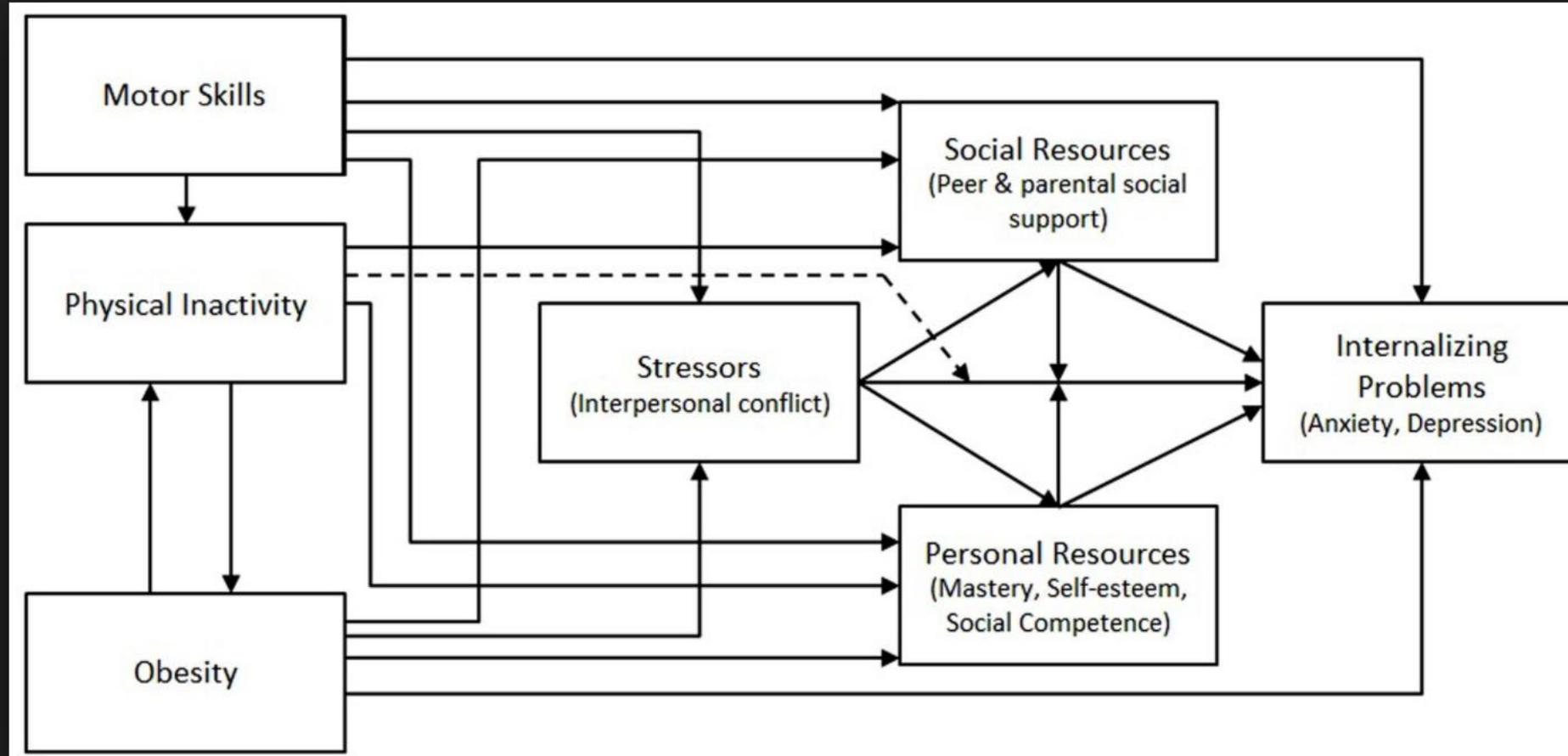
- **Executive function difficulties** (although an area of strength for some) – managing money, planning ahead, organising & finding things (Kirby et al, 2008; 2011; Rosenblum, 2013; Tal Saban et al, 2012; 2014; Purcell et al, 2015)
- **Hot EF-** Emotional responses to motor problems leading to higher anxiety (Rahimi-Golkhandan et al, 2016)
- **Loss of attention** (Kirby et al, 2011; Tal Saban et al, 2014)
- **State and trait anxiety** (Hill & Brown, 2013; Kirby et al, 2013)
- **Symptoms of depression** (Hill & Brown, 2013; Kirby et al, 2013), higher rates of clinical depression (Hill & Brown, 2013)
- **Spending leisure time alone** (Kirby et al, 2011)
- **Global self-esteem** (Eggleston et al, 2012; Tal-Saban et al, 2012)

# Impact related to poor motor functioning

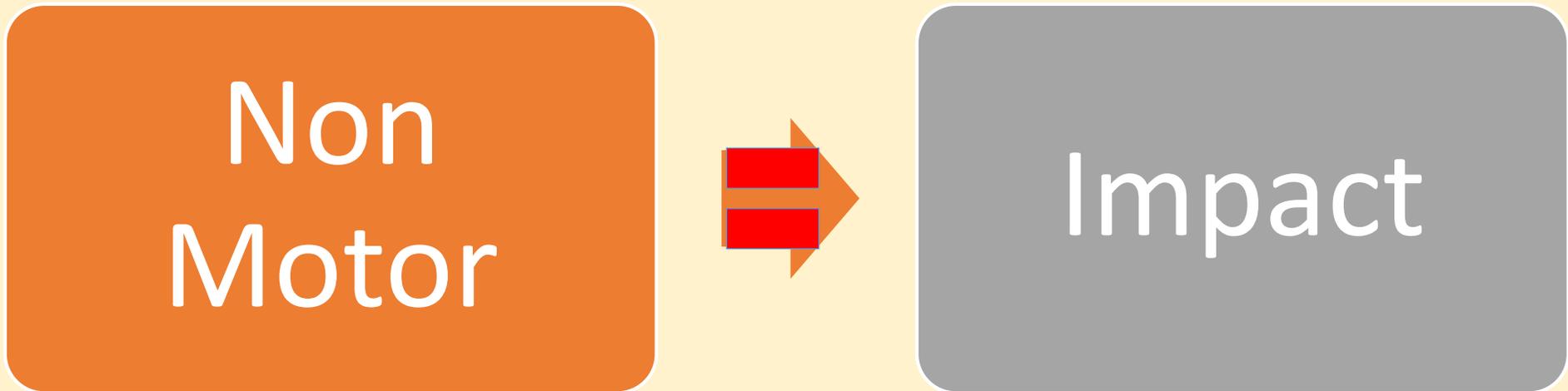
- Reduced levels of physical activity (Hill & Brown, 2013)
- Higher BMI, higher rates of obesity (esp. in females) (Cantell et al, 2008)
- Lower endurance, flexibility, strength (Cantell et al, 2008)
- Poorer metabolic indices (e.g. cholesterol measures) (Cantell et al, 2008)
- Poorer general health (mental & physical) (Kirby et al, 2013)
- Fatigue (Thomas, Kirby, 2015)
- Sleep problems (Law & Barnett, 2016)
- Close Relationships
- Gaining employment
- Leaving home

# Environmental Stress Hypothesis

Cairney et al. 2013  
Mancini et al, 2016



# No motor = NOT DCD



# Diagnosing DCD/Dyspraxia

# To identify DCD/Dyspraxia the assessment should:

- A. Use recognised screening instruments:** to screen for DCD- ADC recommended in European and UK guidelines
- B. Undertake a structured diagnostic interview for evidence of past and current motor symptoms** (e.g. **DIDA** interviews) aligned to DSM-V



**C. Gather a detailed history** with a particular emphasis on developmental and childhood history , screening for other disorders, family history, social development, educational development.

**D. Evaluate impairments/needs:** Matching symptoms to impairments is an essential part of the diagnostic process. These will not be restricted to the academic arena alone;

Assessors would expect to see moderate to severe impact in other domains. (Note: some individuals can display symptoms without impairment.)

## **E. Collect collateral/informant account:**

- History and description of DCD symptoms and impairments in childhood (e.g. usually from parent for account of childhood symptoms/difficulties)
- Review of school reports if available
- Informant/partner account of current symptoms and impairment
- ADC to capture child and adult symptoms

**Rule out other reasons present for motor difficulties- e.g. GP checks out or been seen by other health professionals**

**F. Psychometric tests:** These are not predictive of DCD, but they can be useful to **support conclusions** and identify specific areas of cognitive performance impairments (e.g. general cognitive ability, response speed/variability & inhibition, working memory, measures of verbal and visual abilities).

**G. Consider the presence of other commonly associated learning and developmental difficulties/differences** e.g. dyslexia, ADHD, ASD, DLD and dyscalculia e.g. asking relevant questions or using screening tools.

# DIDA (Kirby, Barnett, and Hill, 2018)

- Developed as a basis to provide a structured process for screening and assessment for DCD/Dyspraxia.
- Circulated for comments and feedback during the development with assessors, psychologists, researchers and clinicians.

# DIDA (Kirby, Barnett, and Hill, 2018)

## Diagnostic Inventory for DCD Assessment

- Provides a process for the dialogue and information gathering that is consistent
- Focus on predominant motor symptoms
  - NO MOTOR= It is not DCD!
- Asks about impact in every day life
- Asks about childhood difficulties as well as now
- Flags up concerns that may require referral to GP/specialists
- **Notes contain guidance for assessors throughout the process**

# DIDA

(Kirby, Barnett, and Hill, 2018)

## Motor related issues in childhood (Pre-school, Primary and Secondary schools)

In order to demonstrate events and impact.  
These can be used as prompts if required.

### Assessor:

"I want to find out about how things were for you, day to day when you were a child, either in or out of school and if movement and co-ordination difficulties impacted on you day to day and in participating in activities that you would have liked to do, or needed to do?"

	Identified as problematic
<b>Gross motor/Balance</b>	
Type of sports chosen in/out of school and why/when e.g. position played in school/choice of non- team/ball sports.  (Note to assessor: Some children can have a passion for a specific sport that results in them practising a lot and improving their skills. If DCD seems likely, and the person is playing a ball or balance sport, ask about amount of practice since childhood).	
Type of sports/activities avoided and why was this and when?  (Note to assessor Comments from others; other children leaving them out; being placed in 'goals')	
Experience of playing in team games in primary and secondary school  (Note to assessor: ask them what it was like)	
Others comments on motor skills- anything else of relevance?	
Experience of learning to ride a bike or not doing so?	
Using climbing equipment in playgrounds, falling, hurting oneself, breaking bones?	
Others recognising running style (ungainly, slower, speed) including comments made by others.	
Difficulties with playing ball games e.g. kicking, throwing, catching compared with others of a similar age.	
Sporting events at school-choice, participation, impact, avoidance e.g. sports day.	
<b>Fine motor/Self – organisation</b>	
Avoidance of construction toys e.g. Lego	

**DSM-V**

*The motor skills deficit significantly or persistently interferes with activities of daily living appropriate to the chronologic age (e.g., self-care and self-maintenance) and impacts academic/school productivity, prevocational and vocational activities, leisure, and play.*

Use **ADC for current motor related skills** and level of impairment and to gain the total score.

Assessor

"I want to find out about how things are NOW day to day, and if movement and co-ordination difficulties impact on you, day to day and in participating in activities you would like to do, or need to do?"

Ask the following to gain the specific examples of impact and interference in Activities of Daily Living (ADL).

Greatest problem(s) day to day?	
Support currently received at home or in college/university/work . Who provides this support and what form does it take?	
<b>Fine motor and organisation</b>	
Note taking in class/lectures/work setting slow/illegible/impact on functioning	
Do you avoid any sort of fastenings on shoes or clothes?	
Difficulties with self -care regime	
Slower completing assignments, exam time, under time pressures	
Ironing, folding items, packing bags	
Do you have difficulties with using utensils in the kitchen at all?	
Doing DIY tasks? Do others comment on this at all?	
<b>Gross motor</b>	
Types of sport (if any) chosen? What avoided and why?	
Avoidance of motor tasks or sports because of difficulties e.g. running, participation in team sports	
<b>Impact on activity and participation</b>	
Specific activities avoided day to day e.g. Learning to drive Note to assessor: if they give an example ask why is it problematic to seek out information about the motor/planning components.	
Social situations avoided and if so why e.g. dancing, clubbing	
Any related fatigue issues as a consequence of motor difficulties	
Impact in gaining employment or in studies/interviews	

# DIDA

(Kirby, Barnett, and Hill, 2018)

**DSM-V-***The onset of symptoms is in the early developmental period.*

Ask: When did you first notice or others such as your parents/guardians/health visitors or teachers) that you had some difficulties with your co-ordination?

You may need to ask individual ask parents if they know this information.

Assessor

“I want to find out if there is anything in your very early childhood that may have indicated that you could have motor difficulties. If you say yes to any of these it doesn’t necessarily mean you have DCD, but I want to try and build a picture with you to assist in making a diagnosis”

<p>Do you know if you have any delay with any of your motor milestones? (Note to assessor: walking later than 18 months) If yes, tick box. (Note to assessor: A lack of delay doesn’t preclude DCD either)</p>	
<p>Do you know if you had any delay in speech/understanding?  (Note to assessor: DCD has been shown to overlap with language difficulties. Verbal dyspraxia can also overlap with DCD)</p>	
<p>Has anyone else recognized /been concerned about motor difficulties? What did parents/guardians/health visitor notice? What happened as a consequence of this?</p>	
<p>Any standardised assessments taken/ or reports?</p>	
<p>Have you ever received any intervention/ or specific support as a child for your co-ordination? If so by whom e.g. occupational therapist or physiotherapist?  (Note to assessor: If yes, this may signify motor difficulties were recognized by others.)</p>	
<p>Have you been referred for an assessment because of your motor skills/difficulties in the past? If yes, to whom and when?  (Note to assessor: If yes, this may signify motor difficulties were recognized by others.)</p>	

Anyone else in your family got a diagnosis of DCD/Dyspraxia?

(Note to assessor: DCD can run in families, and/or there may be the presence of other developmental disorders as they overlap often).

**DSM-V**

*The motor skills deficits cannot be better explained by intellectual disability or visual impairment and are not attributable to a neurological condition affecting movement (e.g. cerebral palsy, muscular dystrophy, or a degenerative disorder).*

You need to have evidence of this e.g. a GP letter, previous consultation or a report.

Ask the following.

If YES to any of the following then DCD diagnosis can't be given until ruled out.

Assessor

"Are you concerned about any of the following?"

<p><b>Any other known motor difficulties</b> (concern about or been diagnosed with) e.g. Cerebral Palsy, Tourette's syndrome, Muscular Dystrophy, Parkinson's, Multiple Sclerosis, Motor Neurone Disease, stroke (CVA), Huntingdon's chorea that you are aware of, or concerned you may have?</p>	
<p><b>Are you at all concerned that your co-ordination has deteriorated in anyway the past 12 months</b> e.g. walking, writing, co-ordination, have a tremor you didn't used to have, loss of skills?</p> <p>(Note to assessor:If yes, indicate the need to see G.P. and the diagnosis of DCD cannot be made.)</p>	
<p><b>Vision not been checked?</b></p> <p>(Note to assessor Poor vision could impact on motor functioning. Encourage the person to have their vision checked if it is more than 2 years since last testing.)</p>	
<p><b>Note to assessor :</b></p> <p><b>Intellectual disability/Low IQ present</b>– Is there information from cognitive assessments that suggest that the individual could have a learning disability. Motor difficulties would have to be below other areas of functioning to gain a diagnosis of DCD – this requires specialist assessment.</p>	
<p><b>Motor symptoms arose in adulthood</b> (The person should be seen by GP).</p>	
<p><b>Motor symptoms arose after road traffic accident or brain injury</b></p> <p>(Note to assessor :The person should be seen by GP).</p>	

## Other relevant information

### Note to assessor

#### Ask about past relevant history

Any other known learning difficulties or relevant diagnoses e.g. Dyslexia/ADHD/ASD/Dyscalculia/Developmental Language Disorders that may be co-occurring or the reason for presentation. DCD often overlaps with other conditions.

Do you think you may be depressed ( feel low, sad,tearful), or feel anxious ( caan't focus, feel agitated, have palpitatons), or may have any other mental health challenge that need to be considered for reasons for fatigue, low mood, avoidance of sports/participation?

Are there any other reasons do you think for motor difficulties being present e.g.avoidance of sports/participation/lack of opportunity to practice?

# Motor signs- Current history

## Resulting in limitations on activity

- Participation in sport, fitness, fatigue, independent living skills, not being able to drive a car or have difficulties parking/bumps
- Self care- ironing/folding clothes
- Food preparation

## Less participation

- Writing notes in lectures
- Others not being able to read writing
- Friendships, relationships
- Avoiding team sports

# Motor signs- In childhood

## Limitations on activity

- Choice of sports
- In the classroom
- Taking down hand written notes
- Getting dressed/undressed/laces and fastenings
- Riding a bike

## Participation

- Friendships- in and out of school
- Bullied because of motor difficulties
- Not in team sports
- In the playground
- Socially – parties, out of school activities such as Cubs, Brownies

# Triangulation of information- where possible

- **Gaining information from 'others' where possible**
  - Parents/partner main concerns/employer
- **Past history** - school experiences, work experiences e.g. school reports/ telephone contact/ health professional reports

# Listen out for Red flags

- Loss or deterioration in motor skills
- Functional loss e.g. could make food/dress and now can't
- A new problem
- No childhood history
- Reported
  - Asymmetry of movement
  - Loss of muscle mass
  - Tremor
  - Pain in joints
- Headaches
- Increased change in mood
- Memory loss



# Need to consider *differential* diagnoses

## G.P. suggested checks these out

### As a child

#### Associated

- BECCTS
- Joint Hypermobility Syndrome

#### Differential

- Cerebral Palsy
- Muscular Dystrophy
- NF1
- CVA
- Klinefelter's syndrome
- Fragile X
- Williams

### As an adult

- Multiple Sclerosis
- Cerebral tumour
- Parkinson's
- Genetic conditions emerging in adulthood e.g. Huntington's Chorea
- CVA
- Arthropathies
- Joint Hypermobility Syndrome (JHS)

# Consider 'common' co-occurrences

- **Autism Spectrum Disorder** - screening using AS-Quotient/EQ
- **Dyslexia**
- **Dyscalculia**
- **Speech Communication and Language Needs**
- **ADHD**- screen using Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist
- **Mental Health** e.g. Anxiety (HADS), Depression (BECKS)
- **Epilepsy** (BECCTS in past/current)- -refer if concerned
- **Chronic Fatigue Syndrome**- common

- **Motor and Maths** (Luo, Jose, Huntsinger, & Pigott, 2007; Pagani, Fitzpatrick, Archambault, & Janosz, 2010; Pieters, Desoete, Roeyers, Vanderswalmen, & Van Waelvelde, 2012).
- **Motor and Reading** (Cheng et al, 2009; Fletcher-Flinn, Elmes, & Strugnell, 1997; Lingam et al., 2010)
- **Motor and ADHD** (Kadesjö and Gillberg, 1998, Kadesjö and Gillberg, 2001; Tervo et al., 2002; Piek et a,2003;Orit et al, 2010)
- **Motor and ASD** (Dewey et al,2002;Chen et al, 2009;Leonard et al, 2014)
- **Motor, ADHD and ASD** (Rieresen et al,2008)
- **Motor and Language** (Hill,2001)

**Co-occurrence**

# What assessments can we use and why?

*“Tests don’t diagnose... people do”*

# Screening tools

- The Adult DCD Checklist (ADC) ( Kirby and Rosenblum) – normed on UK population.
- Adolescents and Adults Coordination Questionnaire (AAC-Q) ( Tal Saban et al)

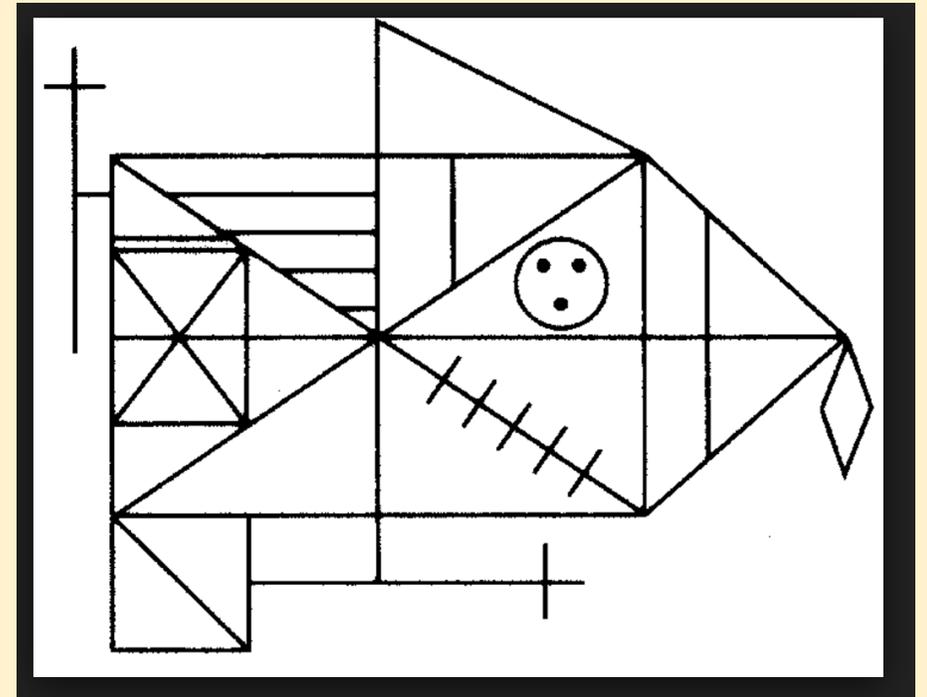
# Motor assessments in adulthood

**Some performance tests are currently being used :**

- DASH 17+ Handwriting
- Bruininks-Oseretsky Test, 2nd Edition (BOT-2)-up to 25 years
- Movement Assessment Battery for Children (MABC-2) – up to 16 years 11 months

Further work is needed to establish their use with adults

- Purdue Pegboard (18-69 years)
- The Rey-Osterrieth Complex Figure (ROCF)



52 children (mean age, 9 years) with a diagnosis of DCD were matched to 52 TD children by age and gender.

Cognitive ability was assessed using the [Wechsler Intelligence Scale for Children\(WISC-IV\)](#).

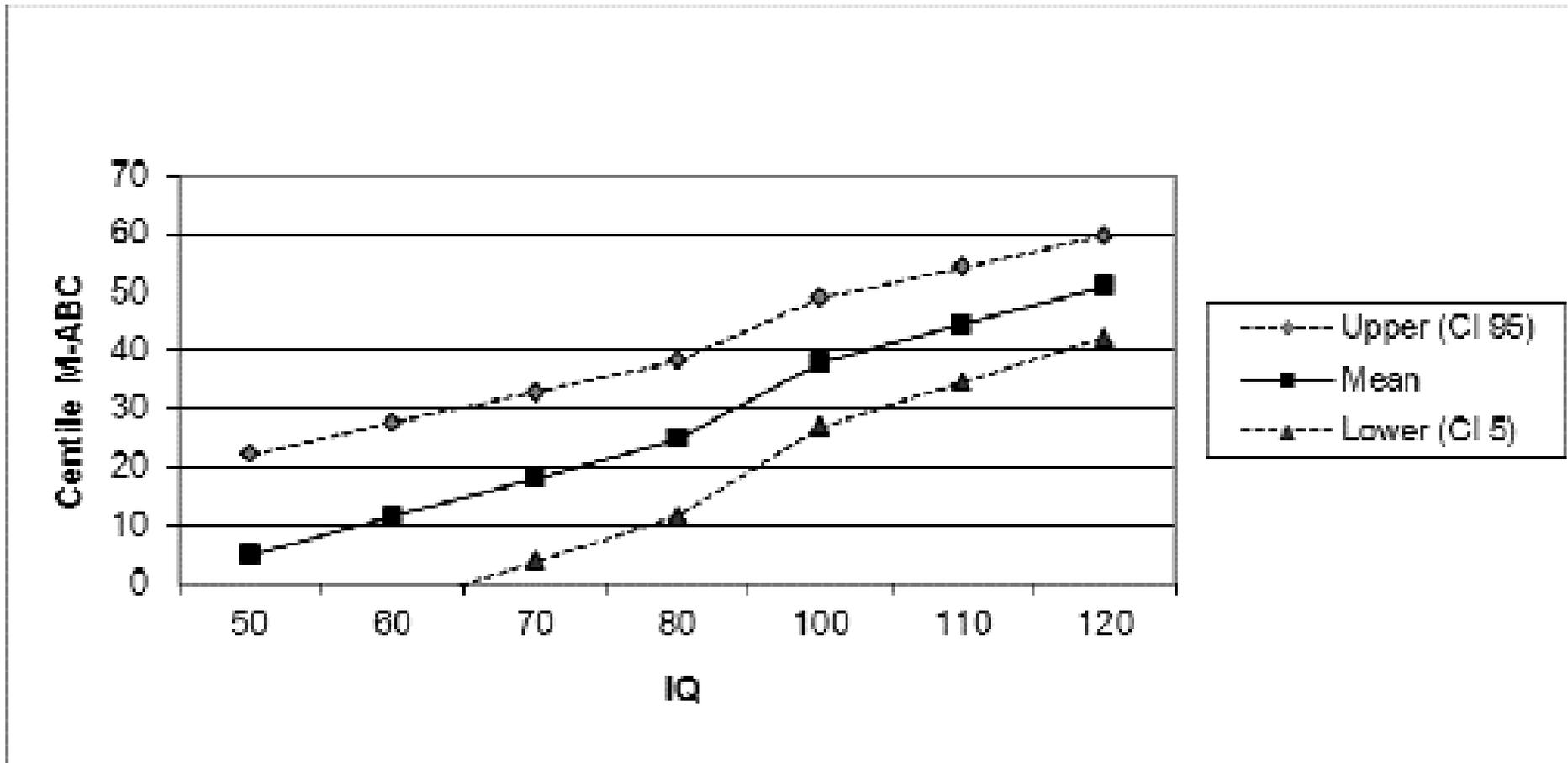


Fig. 2. Variation of scores on the WISC subtests.

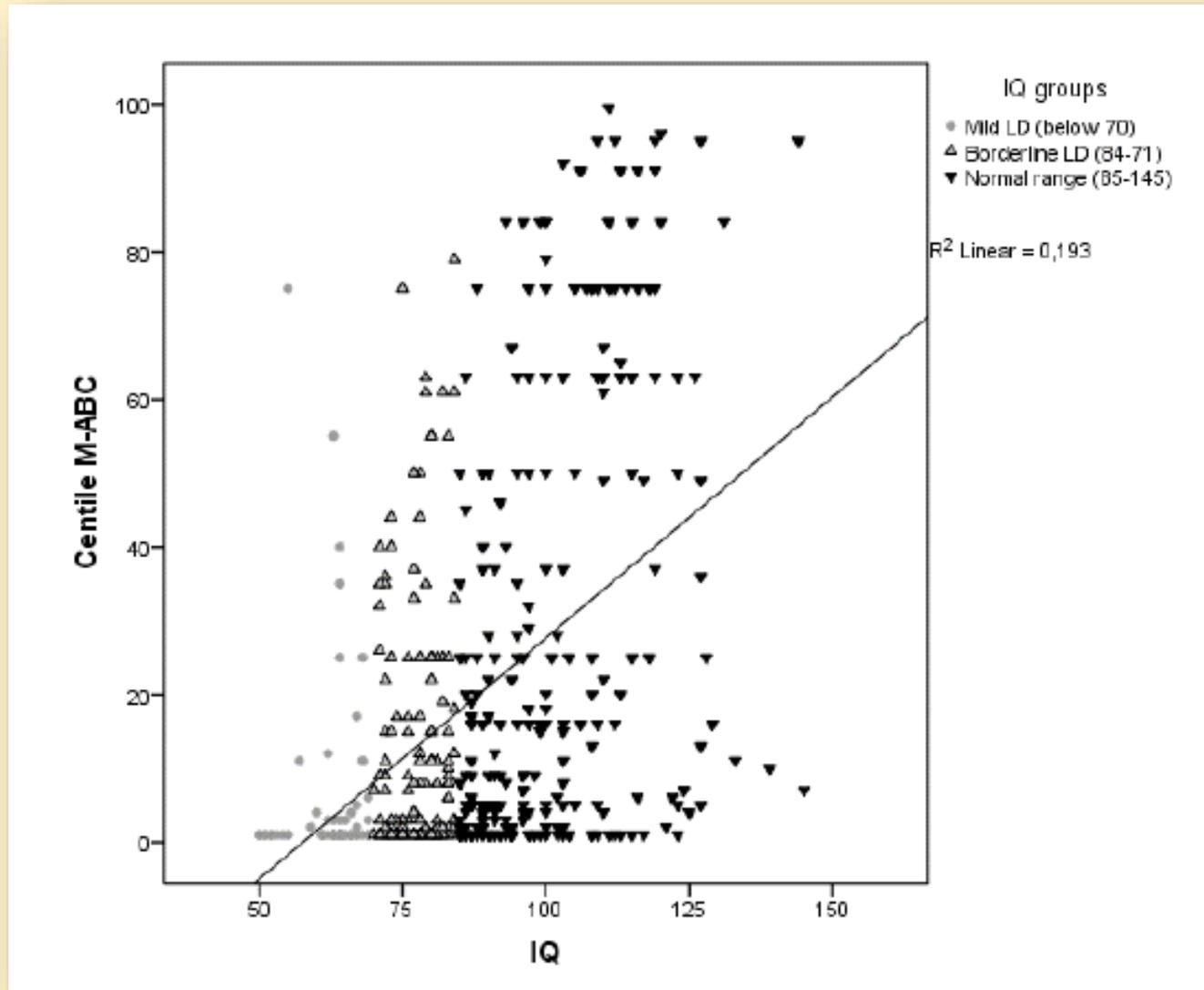
**Overall  
no  
differences at  
a group level**

# IQ and motor ability (M-ABC)

Examining the cognitive profile of children with Developmental Coordination Disorder. Sumner, Emma ; Pratt, Michelle L. ; Hill, Elisabeth L. Research in Developmental Disabilities, 2016, 56, pp.10-17



# Variation is the rule



## WISC-IV General Ability

Index might be a more robust measure of intellectual functioning than FSIQ for children with DCD, as suggested by [Oliveras-Rentas et al. \(2012\)](#) for an ASD population.

- Huge variations between individuals
- Results of WISC/WAIS should not be used for diagnosis for DCD **but to inform intervention**
- Other co-occurrences need to be considered always

## Beery Buktenica (VMI) is not a diagnostic tool for DCD and doesn't relate well to functional impairment

Full Length Article

### Visual perceptual and handwriting skills in children with Developmental Coordination Disorder

Mellissa Prunty <sup>a</sup>  , Anna L. Barnett <sup>b</sup>, Kate Wilmut <sup>b</sup>, Mandy Plumb <sup>c</sup>

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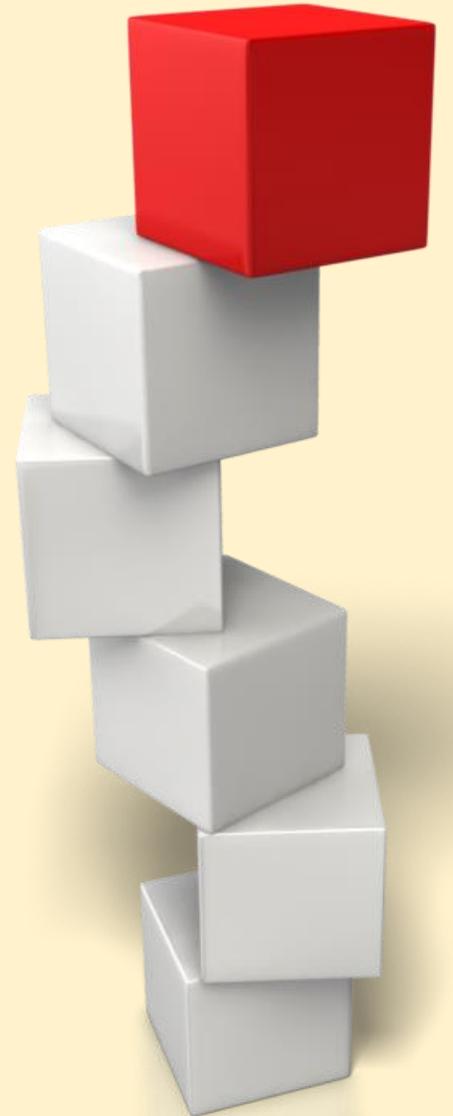
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#### Highlights

- Children with DCD scored lower on the measures of visual perception compared to TD children.
- Measures of visual perception did not correlate with handwriting performance in either group.
- Tests of visual perception failed to identify 58–70% of children with handwriting difficulties.

## Neurodiversity

Everyone is different and people's lives change....so assessment for needs may need to undertaken at different stages



# Key points

- DCD common affecting about 3% of adults
- DCD is a motor condition
- Overlaps commonly with other learning difficulties
- Common presence of anxiety and risk of depression
- DIDA provides a framework for assessment
- If concerned about 'other' reasons for motor difficulties need to be seen by G.P.



UK DCD Consensus

Documents

Conferences

Links

## Useful documents and videos

We have produced a series of leaflets, through a consensus process led by Movement Matters, which involved relevant stakeholders and organisations from across the UK.

You can view these leaflets using the links on the left, or can download them below.

- [Information for primary school teachers](#)
- [Information for secondary schools](#)
- [Information for those studying or working in Further and Higher Education](#)
- [Information for parents](#)
- [Information for employers](#)
- [Information for allied health professionals](#)
- [Information for General Practitioners](#)
- [Information for Educational Psychologists](#)

### Welcome to Movement Matters UK

#### Movement Matters UK

Movement Matters is the UK umbrella organisation representing the major national groups concerned with adults with coordination difficulties, a condition called Developmental Coordination Disorder (or DCD) also referred to as 'dyspraxia'.

Movement Matters was formed early in 2011 to act as an umbrella group to bring together the key bodies: Developmental Coordination Disorder/Dyspraxia in the UK.

This includes DCD-UK, The Dyspraxia Foundation, The Developmental Adult Neuro-diversity Association and the National Handwriting Association.

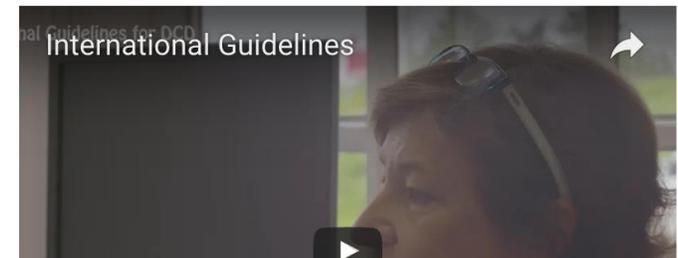
Contact: [info@movementmattersuk.org](mailto:info@movementmattersuk.org)

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[www.movementmattersuk.org](http://www.movementmattersuk.org)



What are the international criteria for DCD (DSM-5/ICD-10)?





Hidden Impairment National Group

Enable  
Accessibility

Home

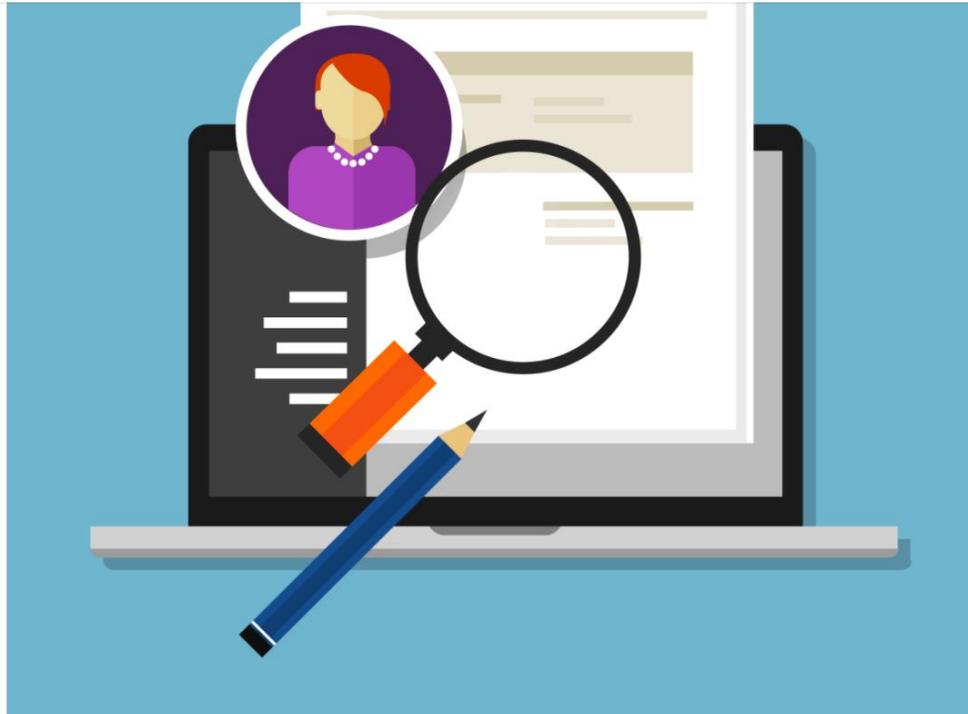
HING

Employers

Job seekers

In employment

Useful information



ADHD

Autism Spectrum Disorder

Dyslexia

Dyscalculia

Dyspraxia/DCD

Language and Communication

<http://www.neurodiversityemployment.org.uk/>



Useful Websites and Organisations  
Videos to Watch | Ideas to Help

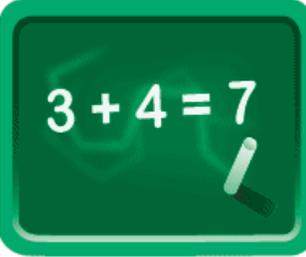
**Resources**

**Contact**

**Discuss**

The one stop shop for nurturing children with 1000s of ideas, guidance and information on everything from early years to further education.

**Search this site for:**



## Practical Skills for School

**Discuss & Contribute >>**

**Help us to help other Parents**  
Give us your ideas and tips... [more!](#)

**Handwriting or IT Skills?**  
Persevere with poor handwriting... [more!](#)

**Potty Training and Dyspraxia**  
Are you looking for advice... [more!](#)

**Dyspraxia or DCD?**  
Are you looking for support... [more!](#)



### Practical Skills at Home

<b>Hobbies &amp; Leisure</b>	About choosing a hobby, Archery, Ball Skills, Martial arts More . . .
<b>Independent Living Skills</b>	Bedtime, Bathtime, Dressing, Hygiene for boys

### Practical Skills at School

<b>Pre School</b>	Choosing a school, painting, reading, writing, scissor skills, motor skills, More . . .
<b>Primary School</b>	Classroom skills, homework, reading, mathematics



HUMAN HORIZONS SERIES

# How To Succeed in Employment with:



A Guide for Employees and Employers

**Amanda Kirby**

# How To Succeed in College and University with:



A Guide for Students, Educators & Parents

**Amanda Kirby**

**DIDA** (Kirby, Barnett, and Hill, 2018)

**Diagnostic Inventory for DCD Assessment**

**Downloadable from the SASC website:**

**[www.sasc.org.uk](http://www.sasc.org.uk)**