

What Is DCD?

Developmental Coordination Disorder (DCD), also known as Dyspraxia, is a neurodevelopmental disorder identified primarily by difficulties with physical coordination. DCD has an estimated prevalence rate of 5-6%, meaning that at least one child in every class of 30 is likely to be affected (APA, 2013). DCD has an early age of onset and can result in delayed movement milestones such as learning to dress oneself or handle cutlery (Summers, Larkin & Dewey, 2008).

Diagnostic criteria for DCD include:

1. Performance and acquisition of motor skills is significantly below what could be expected given the individual's age and opportunity for practice.
2. The identified motor difficulties represent a significant obstacle to the completion of daily living activities.
3. The movement symptoms must have had an onset early in development.
4. The motor difficulties are not better explained by an alternative diagnosis, such as intellectual disability or a neurological condition.

Whilst not part of diagnostic criteria, a persistent and significant finding has been impairment in visuo-spatial executive function (Bernardi et al., 2018). Visuo-spatial executive function is an umbrella term which covers processes involved in the manipulation of spatial information and is commonly assessed using tasks such as Matrix Reasoning and Block Design. Difficulty with executive control of visuo-spatial tasks has a pervasive influence on everyday living tasks, such as difficulty with mathematics (Alloway, 2007), judging the speed of moving objects, and spatial awareness, which in-turn negatively impact areas such as confidence in road crossing (Wilmut & Purcell, 2020) and learning to drive.

Despite the impact on everyday life and high prevalence of DCD compared to other neurodevelopmental disorders such as Autism Spectrum Disorder, DCD is not well understood or recognised in educational and medical settings, meaning that appropriate support is not always available (Hunt et al., 2020). However, in recent years awareness of the condition has been slowly increasing due to the activities of organisations such as the Dyspraxia Foundation, increased research, and celebrity exposure.

Common Strengths

While DCD is noted to be heterogenous and possessing overlap with ASD and ADHD, good verbal skills have been highlighted as an area of consistent relative strength for individuals with DCD (Bernardi et al., 2018). Over a period of two years, this research demonstrated that despite poorer visuo-spatial skills when compared to their peers, children with DCD made similar developmental gains, and did not fall behind in terms of verbal skills.

Additionally, those with DCD have been noted as often possessing great creativity and excellent long-term memories. Adults with DCD have also been noted as having high levels of empathy (Tal-Saban & Kirby, 2019).

Common Challenges

It remains to be seen, in the research literature, whether and how these areas of strength can be leveraged to improve educational experiences and outcomes for people with DCD.

In an educational environment, individuals with DCD very often have difficulty with common everyday tasks, such as handwriting, organisational skills and following complex instructions (Summers et al., 2008). DCD symptoms do not resolve with practice and have a significant and persistent impact on quality of life and outcome during childhood, adolescence, and into adulthood. The movement difficulties inherent in DCD can also present challenges via potential social exclusion, as children with DCD are seen to spend more time alone and as being 'onlookers' more often than other children during playtimes. Visible difficulty engaging in sport and play activities can result in poor self-esteem, peer victimisation and consequent disengagement from social activities (Zwicker et al., 2018).

In older children, DCD has a negative influence upon educational outcomes, as indicated by Harrowell et al., (2018) who showed that teenagers with DCD attain a median of 2 GCSEs at grades A*-C compared to a national median of 7. The same study also noted around 40% of children with DCD receive no formal support at all and parents who do secure support for their children report that it is not always appropriate, mainly due to a lack of understanding of the condition.

For adults with DCD, areas of concern include mental health, day-to-day organisational skills (Purcell et al., 2015), and learning to drive. DCD has also recently been noted as being one of the least known neurodevelopmental disorders among medical professionals (Hunt et al., 2020), meaning that support for adults with DCD is often very limited.

The Evidence on Supports

Supporting the social development of children with DCD via education of the general public of parents, teachers and children, and interventions to improve self-esteem are of paramount value.

Some motor skills interventions have been developed for children with DCD and focus on everyday tasks such as handwriting, dressing and riding a bike. However, given the nature and persistence of DCD into adulthood, interventions are needed to support equitable participation in education as well as improving movement. This might include the use of word processors or a scribe. Additional time in educational settings and breaking the instructions for complex tasks into smaller sub-tasks, which can be completed with reference to step-by-step instructions, can also be useful. Allowing more time for organisation and planning at the beginning of a task, and verbal encouragement, can help reduce frustration in the individual with DCD.

Inclusive learning practices have been surveyed for usefulness for individuals with DCD in university contexts, where the provision of lecture slides before the lecture and the availability of core texts were highlighted as the most useful practices (Sumner et al., 2021).

For some with DCD, self-care tasks may also be an area of difficulty from childhood into adulthood. Difficulty with dressing can be assisted by use of shoes with Velcro in place of laces, patterned fabrics to reduce the visibility of spills and elastic waistbands instead of belts.

What's Next in Research?

Research interest is increasing in DCD, with recent studies beginning to look more closely at neurological differences underlying the condition, with a renewed interest in intervention development. More attention is also beginning to be paid to how DCD

has an ongoing impact throughout the lifespan. Thus far, the majority of research has looked at DCD in childhood only; recently, more research labs are now beginning to look at DCD in adults.

Current research at the University of Surrey, has:

- 1) highlighted driving as an area of difficulty and concern for adults with DCD (Gentle et al., 2021).
- 2) found that the movement coordination differences in adults with DCD attracts negative social judgements from others (Gentle et al., 2020).
- 3) shown that difficulty processing physical perceptions, such as touch, may impede the ability to internally represent and plan movement.

Finally, work in the same team has just started to investigate the effect of DCD on experiences in Higher Education and to develop a toolkit to educate teachers and support students with DCD.

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