

Divergent Development in Dyspraxic Children: Part II Synopsis

In the second part of the report, we are focusing on six domains: **Detailed Medical History, Sensory Processing, Social Life, Autistic Behaviors, and School Life**. These domains primarily will help to characterize the psychosocial implications of DCD.

Detailed Medical History

- Medications:

- Almost 80% of participants take a daily supplement. 63% of participants take Omega 3.
- 37% take prescription medications. The most frequently prescribed medications are stimulants (12.5%) and SSRIs (8.5%). Given the high comorbidity with ADHD and anxiety disorder in our cohort these medications are to be expected. Both proportions are higher than those expected from the normal population. The prevalence of children with an ADHD diagnosis and stimulant medication in the normal population is ~4.5%, thus significantly lower than in our questionnaire cohort. Similarly, the reported prevalence of antidepressants in youth is 1.6%, which is also lower than the prevalence in our cohort.

- Oculomotor issues:

- DCD can affect coordination of all muscles of the body, not only the upper and lower limbs leading to fine and gross motor issues. Notably, oculomotor issues can affect the development of visuo-spatial and academic skills such as reading.
- About one third of participants reported having seen an optometrist because of oculomotor issues (74/200) at an average age of 4. This suggests that oculomotor issues are apparent early in DCD – sometimes before the DCD diagnosis has been made.
- 23% of participants received vision therapy to treat oculomotor issues.
- **A check-up by a developmental optometrist or developmental ophthalmologist with the relevant background (which not all of them have!) is important for all children with a DCD diagnosis.**

- Speech issues:

- DCD can also affect coordination of the speech muscles – those that articulate language.
- In our cohort, 75% of participants reported speech or language difficulties. More than half of our participants (57%) had been diagnosed with a

speech or language disorder. The most common diagnosis was apraxia of speech.

Sensory Processing

- Hypersensitivity: 80% of participants in our cohort report hypersensitivity (e.g. being bothered by sudden sounds, textures and bright lights). This is a high percentage given that only 11% of participants were diagnosed with a co-morbid sensory and/or auditory processing disorder.
- Eating: 57% of children are picky eaters. They appeared to avoid certain textures.
- Multi-modal integration: In terms of multi-modal integration (i.e. processing sensory information while executing a motor task), auditory processing particularly during writing presents a challenge, which does not improve with age. **It is important for teachers to understand that processing verbal instructions while writing may present a serious challenge for dyspraxic children. As a teacher, make sure that the dyspraxic child does not have to write while you are instructing! Also note that this issue will limit note-taking abilities of dyspraxic children.**
- Visuo-spatial skills: 89% of children have issues with spacing between letters or words during writing. This issue that can critically compromise the legibility of a child's handwriting does not improve with age.

Social Life

- Social interactions: 86% of parents say that their child's interactions are not typical for his or her age. The average participant enjoys playing with other children and tends to play cooperatively. Two thirds of the children prefer to socialize with children who are either younger or older. Parents commented that their children often preferred younger friends, because they were at a similar level of maturity, were not as judgmental about DCD-related challenges (e.g., speech impediments), and allowed the child to take control of the social interaction. Older friends were reported to be more patient and understanding of DCD-related challenges, took the children under their wing, and were often more interested in non-physical activities such as video games and board games.
- Bullying: 55% of dyspraxic boys and 61% of dyspraxic girls had been bullied so severely that a parent had to intervene. Of the affected group, 81% of parents think that their child's DCD was related to the bullying. 45% of children in the age group <5 had already been bullied. Thus, peer rejection starts at an early age for children with DCD.

Behaviors Commonly Observed in Autism Spectrum Disorder (ASD)

- Motor behavior: One characteristic of ASD can be motor challenges, similar to those that DCD children express.
- Social behavior: Children in our cohort are reported “mostly true” or “partly true” for playing cooperatively. However, they do not make friends easily (“rarely true” to “partly true”). Thus, while the social interactions are compromised, as discussed above, there is no clear sign of social behavior that is typical for ASD.
- Ritualistic behaviors: 47% of participants show ritualistic behaviors, such as an inflexible daily routine or an insistence on the arrangement of objects in his or her room. While ritualistic behaviors are a hallmark of ASD, they can also develop to alleviate anxiety and enhance predictability in a physical world that is difficult to interact with.
- DCD children in our cohort displayed on average 2 of 4 autistic traits that we screened for. Also, the DCDQ did not show a clear correlation with the number of ASD traits. Thus, there does not appear to be a clear link between DCD and ASD in our cohort.

School Life

- Academic strengths and challenges:
 - o Most difficult subjects for DCD children are (from the most difficult to least difficult) writing, math, reading, and gym.
 - o The easiest subjects were reading, science, math and ‘none’.
 - o 65% of participants struggle with reading, 70% with spelling, and 70% with math facts.
- Subject-specific school support:
 - o 50% receive reading support.
 - o >60% receive writing support.
 - o 45% receive math support.
 - o 35% receive spelling support.
- Individualized Education Program (IEP):
 - o 75% of participants were on an IEP/504 plan.
 - o IEP support does not decrease across age groups; almost 80% of 10-15 years old children need support! – another indication that children do not “grow out” of DCD.
 - o 57% with an IEP/504 plan were classified in Kindergarten, 14% were classified in first grade, and 20% in second or third grade.
 - o Only 22% of our participants received an assistive technology evaluation.

The most promising type of intervention does not appear to be used to the extent it could and should be!

- Writing accommodations:
 - The percentage of school-aged children (i.e. 5 years or older) who use a scribe stays relatively constant at 14-15% from age 5-15.
 - The percentage of school aged children who type in the classroom grows across the three age groups: 11% of 5- to 7-year-olds, 26% of 8- to 9-year-olds, and 41% of 10- to 15-year-olds type on a computer or iPad in school.
 - Correspondingly, the percentage of children who write in the school setting drops: in the two youngest age groups, <5 and 5to7, 75% of children write in the classroom. This falls to 60% in the 8to9 age group and 44% in the 10to15 group.
- Physical and occupational therapy:
 - 58% of participants have received physical therapy (PT), often both private and school PT. The majority had private PT.
 - 96% received occupational therapy (OT), often both private and school OT. The majority had private OT.