UNDERSTANDING MOVEMENT DIFFICULTIES IN CHILDREN

Anna Barnett
Everyday movement skills
Everyday movement skills
Development of movement skills
Learning new skills
Developmental Coordination Disorder (DCD)

American Psychiatric Association (APA, 2013)
World Health Organisation (WHO, 1992)
Understanding movement difficulties by:

- Using standardised tests
- Examining tasks in the lab
- Listening to children & parents
Standardised Tests

Movement ABC-2 tasks
Profile of test performance

The graph shows the standard score for different movement ABC-2 tasks. Task 5 has the highest standard score, while tasks 1, 2, 3, 6, 7, and 8 have lower scores. Task 4 also has a slightly higher score than the others.

Detailed Assessment of Speed of Handwriting

Understanding movement difficulties by:

- Using standardised tests
- Examining tasks in the lab
- Listening to children & parents
Examining tasks in the lab
Foot placement & body movement

**Adults with DCD**

<table>
<thead>
<tr>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step length ratio</td>
</tr>
<tr>
<td>Step width ratio</td>
</tr>
<tr>
<td>Double support (%)</td>
</tr>
<tr>
<td>Stride time (seconds)</td>
</tr>
<tr>
<td>Anterior-Posterior velocity (ms(^{-1}))</td>
</tr>
<tr>
<td>Vertical velocity (ms(^{-1}))</td>
</tr>
</tbody>
</table>
Variability of movement

Foot placement & body movement in adults with DCD

<table>
<thead>
<tr>
<th>Variable</th>
<th>DCD</th>
<th>TD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step length ratio SD</td>
<td>.03</td>
<td>.02</td>
<td>.02</td>
</tr>
<tr>
<td>Step width ratio SD</td>
<td>.11</td>
<td>.09</td>
<td>.01</td>
</tr>
<tr>
<td>Double support SD (%)</td>
<td>1.29</td>
<td>1.01</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Stride time SD (seconds)</td>
<td>.02</td>
<td>.01</td>
<td>.03</td>
</tr>
<tr>
<td>Anterior-Posterior velocity (ms(^{-1})) SD</td>
<td>.07</td>
<td>.05</td>
<td>.007</td>
</tr>
<tr>
<td>Vertical velocity (ms(^{-1})) SD</td>
<td>.03</td>
<td>.02</td>
<td>.004</td>
</tr>
</tbody>
</table>

SD – Standard Deviation, a measure of variability
Navigating Apertures
Navigating Apertures
Navigating apertures - adults

Lateral body movement (mm)

Navigating apertures - adults

Reduction in Speed (mm$^{-1}$)

Navigating apertures - adults

Angle at the aperture (degrees)

Examining tasks in the lab
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
The quick brown fox jumps over the lazy dog.
Understanding movement difficulties by:

• Using standardised tests
• Examining tasks in the lab
• Listening to children & parents
Listening to children with DCD

• Eight boys with DCD aged 13-15 years
• Low levels of physical activity
• Child & parent interviews

• Explore possible constraints to being physically active
• Internal & external factors (physical & social)

Motor difficulties

C3: with DCD you think I’m not very good, I can’t do this
C4: to be honest I can’t run at all
P1: his coordination skills and his ball skills aren’t good enough for team games
P4: Football he can’t do because of his difficulties with coordination . . . he is very slow in running
P5: he hasn’t really got the coordination, he can’t get a smooth running stride
P6: he hasn’t got the speed, he hasn’t got the control of the ball

Motivation

• Children: Wanted to participate, enjoyed some activities

• Parents: Keen to find appropriate activities, worked hard to increase participation

External factors - peers

P3: When he was in a rugby match they broke his glasses and that type of thing

P2: he finds it difficult if somebody will take the mickey out of him

P8: He’ll never ride a bike. . . . we bought him a tricycle . . . it cost us a fortune and it was fantastic cos we could go places . . . cycling to school and then somebody took the mickey out of him and he wouldn’t go on it again

External factors - teachers

C3: I have had some really bad experiences with PE . . . the teacher can get frustrated quite easily

C4: they were like screaming at me and saying ‘run properly boy’ . . . I just don’t like to be yelled at to do stuff I’m not very good at anyway

P1: the staff haven’t really helped him along on the PE side at all . . . we actually made a formal complaint to the school. A new teacher proceeded to completely belittle him in the gym session, called him rubbish at catching . . . he was absolutely devastated by it

Understanding movement difficulties by:

- Using standardised tests
- Examining tasks in the lab
- Listening to children & parents
Thank you for listening!

abarnett@brookes.ac.uk

www.psychology.brookes.ac.uk/research/perception-and-motion-analysis