

Individual differences in Developmental Coordination Disorder

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Levels of visual-information processing in deaf and hearing children.

Henderson SE, Henderson L, 1973
The American Journal Of Psychology 86 , 507-21

VISUAL COMPARISON OF WORDS AND RANDOM LETTER STRINGS - EFFECTS OF NUMBER AND POSITION OF LETTERS DIFFERENT

Henderson, L; Henderson, SE 1975
MEMORY & COGNITION 3 97-101

Times Cited: [13](#)

Concomitants of Clumsiness in young school children

Henderson SE, Hall D, 1982
Developmental Medicine and Child Neurology 24: 448-460

Times Cited: [118](#)

Clumsiness in children – Do they grow out of it? A 10-year follow-up study

Losse A, Henderson SE, Elliman D, Hall D, Knight E, Jongmans M. 1991
Developmental Medicine and Child Neurology 33: 55-68

Times Cited: [154](#)

Toward an understanding of developmental coordination disorder.

Henderson SE, Henderson L, 2002.
Adapted Physical Activity Quarterly 19: 12-31

Times Cited: [21](#)

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What do group differences tell us?



What do group differences tell us?

- That a differentiating factor is relevant to the syndrome of DCD
- may generate a theoretical explanation of (an aspect of) DCD; and test that
- may help to improve theory driven diagnostical instruments and procedures: specificity and sensitivity
- may generate theories on remediation of DCD
- may help to improve theory driven intervention procedures and instruments

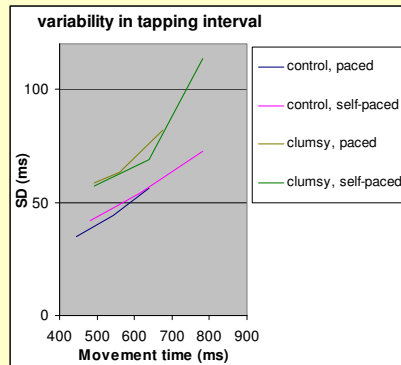
Note from a practical point of view:
the last 3 points have strong relevance for the individual!

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Group difference in within-subject variability

Journal of Human Movement Studies, 1987, 13, 421-432
 INCONSISTENCY AND ADAPTATION IN
 TIMING OF CLUMSY CHILDREN
 R.H.Geuze and A.F. Kalverboer
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- a differentiating factor relevant to DCD
- generated theoretical explanations: >> noise; implications for learning

• and test that

>> noise?

→ see Smits-Engelsman et al.

>> Implication for learning?

→ not addressed yet

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Why do we need to know about individual differences in DCD?

- The distinction between deviant and normal
- Profile of specific motor difficulties and strengths
- Profile of specific developmental difficulties and strengths
- Profile of individual family and school environmental factors, both limitative and facilitative
- The prediction of individual developmental course
- The selection of diagnostical tools and procedures
- Design of intervention programmes tuned to the individual child
- Further aspects of management

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Relevant individual factors

- DSM-IV DCD : age, IQ, PDD?, medical status
- Perceptual and motor
- SES, cultural factors
- Environmental factors: physical, social,
- Personality and interests: shyness, 'dreamer', sportsman
- Other developmental disorders: attentional, learning, ...

Most of these will change with age!

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Do we have individual data on DCD?

- Between-subjects variability (measures)
- Subgroups (cluster analysis)
- Subgroups (individual data analysis)
- Case studies
- Longitudinal data:
 - individual pathways of development
 - individual course in intervention

Oh yes ask Sheila →

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Table I	Clumsy	Control
n	16	16
Sex: M	13	13
F	3	3
Left-handed	2	0

Develop. Med. Child Neurol., 1982, 24, 448-460
 Concomitants of Clumsiness in young Schoolchildren
S.E. Henderson D. Hall

Table II	Clumsy	Control	p
# children failing			
Presence of squint	7	0	**
Motor impersistence	12	7	NS
Standing on one leg	12	1	*

*<0.05; **P<0.01

Comparison of groups

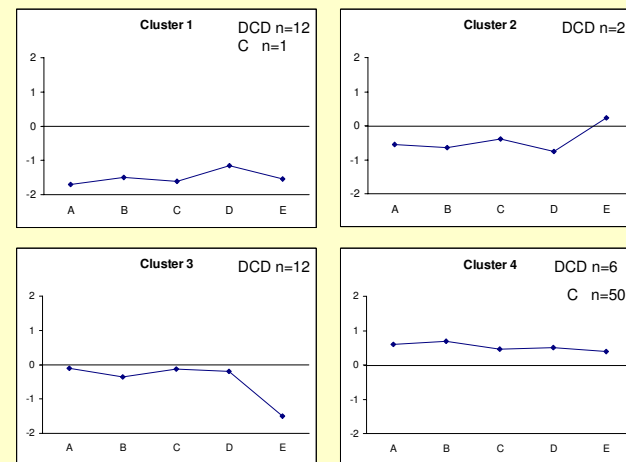
Table IV	Clumsy	ontrol
Motor impairment test: mean	15.12	0.84
SD	4.25	1.4
Drawing scores: mean	2.24	3.81
SD	1.5	1.2
		9

Table III	Social class	IQ (Wisc) Verbal Perf.	Reading MIT	NDS	Medical history
<i>Girls</i>					
1	III M	121	74	good	20.0 11.0 12
2	III M	118	111	good	20.0 5.0 2
3	IV	94	97	good	10.0 15.5 3
<i>Boys</i>					
4	III M	129	129	good	15.0 21.5 3
:	:	:	:	:	:
14	IV	85	97	poor	13.0 15.5 6
:	:	:	:	:	:

Individual data The Sheila Henderson - Oxford

subgroups

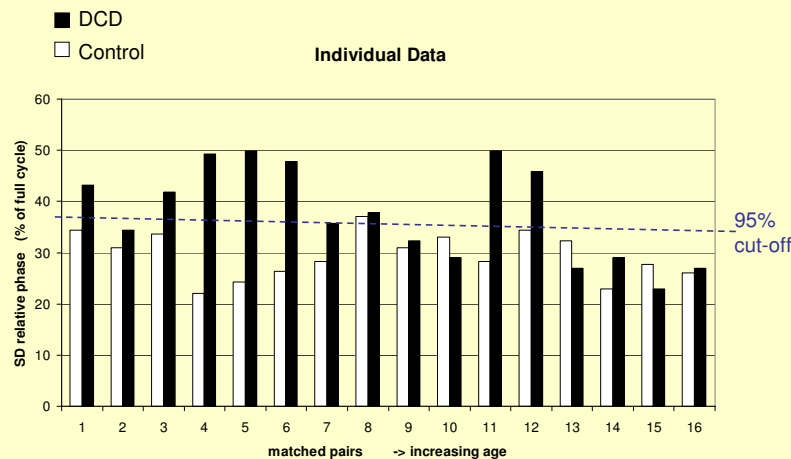
(Dewey & Kaplan, 1994)
 51 DCD; 51 Controls



A=balance
 B=bilateral coordination
 C=upper limb coordination
 D=transitive gestures
 E=motor sequencing

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Individual differences : variability in bimanual coordination



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Individual pathways of development shifted to onset of growth spurt (boys 11-14y)

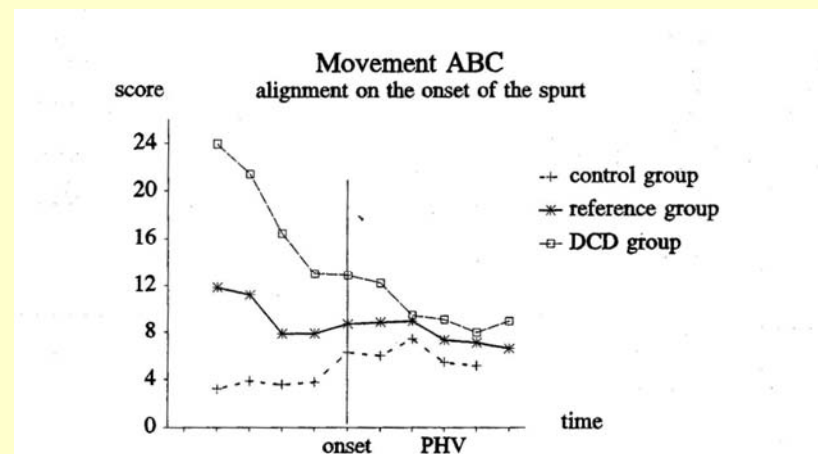
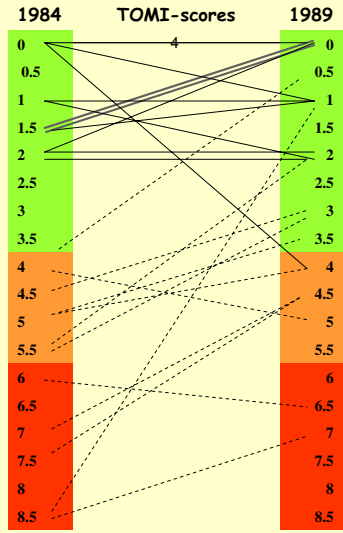


Fig. 5. Spurt related Movement ABC scores (total score) of the DCD (N=14) and control group (N=13) in comparison to the reference group (N=25). (Visser, Geuze & Kalverboer, 1998)

Individual pathways of development



1984 : 6-12 y
1989 : 11-17 y

control n=14
clumsy n=12

Follow-up studies, e.g.:

Losse, A., Henderson, S.E., Elliman, D., Hall, D., Knight, E. & Jongmans, M. (1991). **Clumsiness in children – do they grow out of it? A 10-year follow-up study.** *Developmental Medicine & Child Neurology* 33, 55-68.

Geuze, R.H. & Börger, J.M.A. (1993). **Children who are clumsy, five years later.** *Adapted Physical Activity Quarterly* 10, 10-21

Cantell, M.H., Smyth, M.M. & Ahonen, T.P. (2003). **Two distinct pathways for Developmental Coordination Disorder: Persistence and resolution.** *Human Movement Science*, 22, 413-431.

Case studies: Limitations in 'activities of daily living'

(see Geuze, 2005, 2007, Solal Publishers, Marseille)

Summary of 41 case studies of DCD, in order of reported frequency

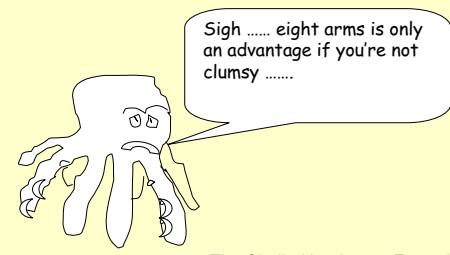
4 - 6 yr	7-10 yr	11-16 yr
Dressing Drawing Locomotion (walk, run) Use of cutlery or scissors	Writing and Drawing Dressing Constructional play Ball games; outdoor play Speech Locomotie	Writing and Drawing Dressing Constructional play Speech Locomotion Tool use
n=9	n=22	n=18

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Conclusion

To understand DCD: the etiology and the dynamical changes during development we need

- combined group and individual analyses
- longitudinal studies: group and case



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