DEVELOPMENTAL PATHWAYS IN MOTOR COORDINATION OF CHILDREN:
THE PITFALL OF THE "AVERAGE CHILD"

Matthieu Lenoir, Farid Bardid, David Stodden
“You cannot hope to build a better world without improving the individuals”

Marie Sklodowska-Curie, 2-times Noble Prize Winner
Different

- Actual level of motor competence
- Developmental rate
PROFICIENCY BARRIER (SEEFELD, 1980)
FOCUS ON “THE AVERAGE CHILD”

Attention for the individual profile or development thereof is
  * scarce
  * at best implicitly present in most studies

= The best way to convince policy makers of the relevance of research in MD?
INTERVENTIONS FOR MOTOR COMPETENCE ARE EFFECTIVE

A ‘typical’ intervention study report

For each child?

Bardid et al., Research in Developmental Disabilities (2013)
COMPARISON WITH REFERENCE VALUES AND CROSS-CULTURAL STUDIES SHOW....
MULTIPLE CAUSES
Robinson et al., 2015
Rodrigues, Stodden, & Lopes (2016)

Focus on physical fitness variables

Positive and negative developmental trajectories (quartiles)

Does a similar tendency hold for coordination?
METHODS (1)

343  

321  

664  

BMI

PHYSICAL FITNESS

2007 (7-9 y)  
2008  
2009 (9-11y)
METHODS (2)

- KTK
- Test for gross motor coordination (Kiphard & Schilling, 2007)
- Raw scores and Motor Quotient (MQ)

- Descriptives
- Latent Growth Curve analysis with BMI and Pacer scores (PF)
RESULTS PART 1:
HOW MANY CHILDREN DEVELOP ‘AS THEY SHOULD’? (MQ)

- Walking Backwards BB Boys
- Moving Sideways Boys
- Hopping for Height Boys
- Jumping Sideways Boys
HOW MANY CHILDREN DEVELOP ‘AS THEY SHOULD’? (RAW SCORES)
HOW MANY CHILDREN DEVELOP ‘AS THEY SHOULD’?

Frequencies
HOW MANY CHILDREN DEVELOP ‘AS THEY SHOULD’?

Individual curves for **Quartile 1** (P0-P25) and **Quartile 4** (P75-P100) over time.

Note: negative/positive trajectories in children with low and high MQ!
RESULTS PART 2

Latent growth curve analysis

a. Random slope on MQ = positive
   • Increase of 3.96 points MQ per year
   • = approx. 8 points each 2 years
   • ‘test effect’?
   • BUT: 5.49 slope variance meaning ...

b. BMI as covariate
   • Increase in BMI = decrease in slope

a. Pacer as covariate
   * Increase in physical fitness = tendency to increase in slope (NS)
CONCLUSIONS

- Children differ in actual motor development status
- Children differ in developmental rate
- Negative developmental rates are often hidden in X +/- SD
- Not all children (equally) benefit from interventions
- Evolution affected by BMI status and to a lesser extent PF
- Focus on lower quartile as a better strategy to convince funding agencies?