Measuring children motor skills with MOBAK-1:

criteria adaptation and comparison of two scoring systems

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1

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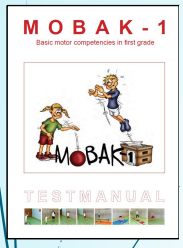
2

Introduction

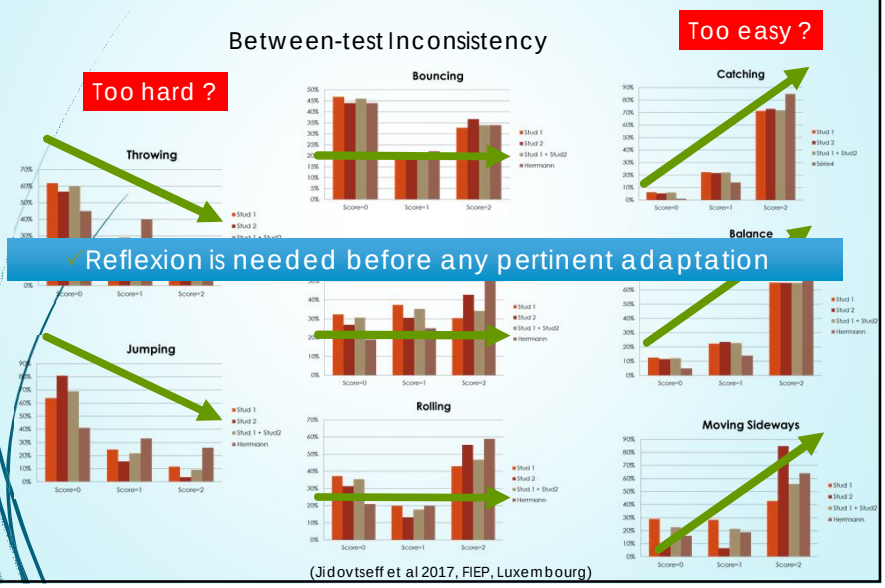


- The MOBAK-1 testing battery has been recently developed with the aim of assessing a wide panel of motor skills in relationship with body movement and object-control abilities (*Herrmann & Seelig, 2014*).
- Mobak-1 testing battery is related with PE program
- This battery is based on a success/failure "dichotomous" scoring system.
- Recent research (Jidovtseff et al 2017) revealed :
  - ✓ Between-test Inconsistency
  - ✓ Shape of the score distribution differs from a test to another

(Jidovtseff et al 2017, FIEP, Luxembourg)

3

Introduction



(Jidovtseff et al 2017, FIEP, Luxembourg)

4

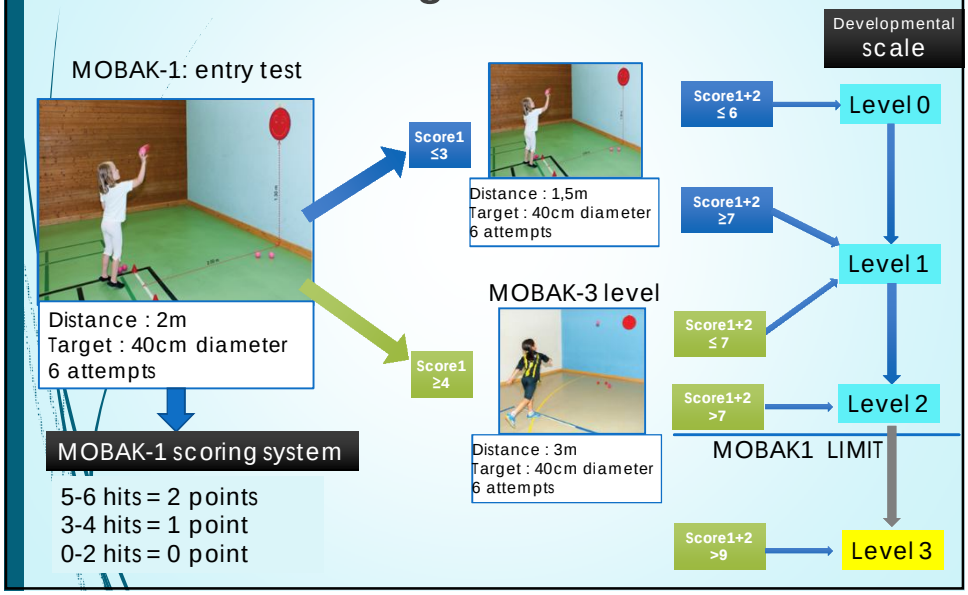
Aim of the study

- ✓ To investigate children MC and to create a "developmental scale"
- ✓ To investigate how MOBAK-1 scoring system is able to situate children in their developmental process
- ✓ To suggest improvements in MOBAK-1 testing battery for a better discrimination

5 Methods

- Population :
  - ✓ 54 children from grade 1
  - ✓ Gender : ♀ = 48% ; ♂ = 52%
  - ✓ Age : 6,83 yo
  - ✓ BMI : 15,90 kg/m²
- Improvements in MOBAK 1 procedure and instruction
  - ✓ Children were shortly familiarized with the test
  - ✓ Additional trial was allowed when children failure was not linked to motor competences (MC)
- Additional subtests in order to investigate children's level more accurately
- "Developmental scale" based on children observation in tests and subtests

6 Throwing test



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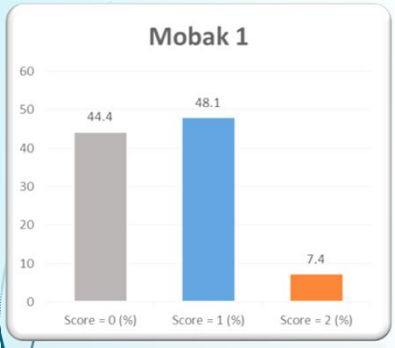
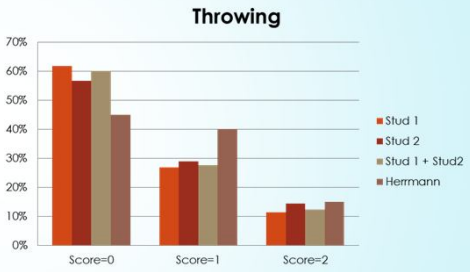
Throwing test



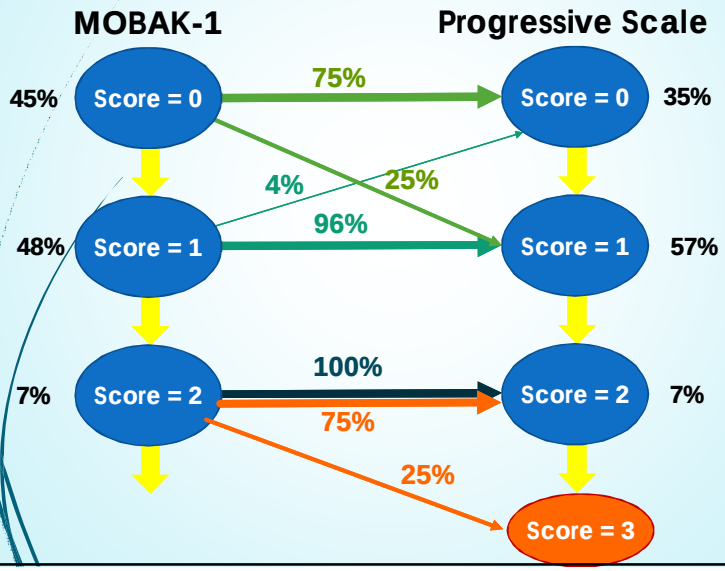


(Jidovtseff et al 2017, FIEP, Luxembourg)

Increase in score 1 => linked to the familiarization ?

8

Throwing test



9

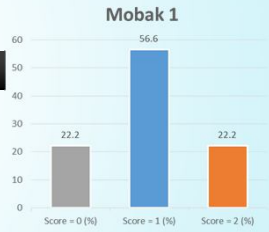
Throwing test : conclusion

- Low rate of “score = 2”
- Changing the scoring system ?

MOBAK-1 scoring system → **Modified scoring system**

5-6 hits = 2 points
3-4 hits = 1 point
0-2 hits = 0 point

4-6 hits = 2 points
2-3 hits = 1 point
0-1 hits = 0 point

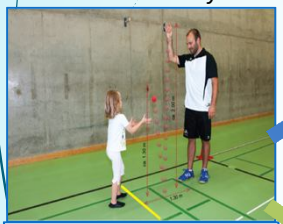


- Reducing the distance to 1m75 ?

10

Catching test

MOBAK-1: entry test



Two hands catching
6 attempts

MOBAK-1 scoring system

5-6 hits = 2 points
3-4 hits = 1 point
0-2 hits = 0 point

Score1 ≤3

Catching a big ball
6 attempts

Score1 ≥4

One hand catching
6 attempts

MOBAK-3 level

Developmental scale

Score1+2 ≤ 6 → Level 0

Score1+2 ≥7 → Level 1

Score1+2 ≤ 7 → Level 1

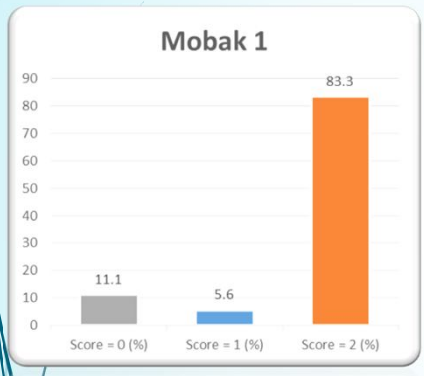
Score1+2 >7 → Level 2

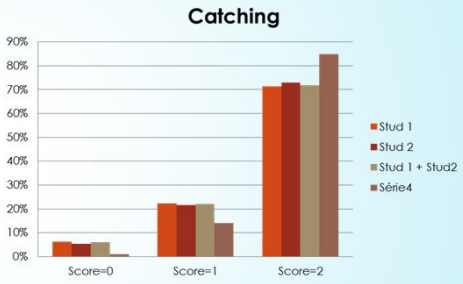
MOBAK1 LIMIT

Level 3

11

Catching test



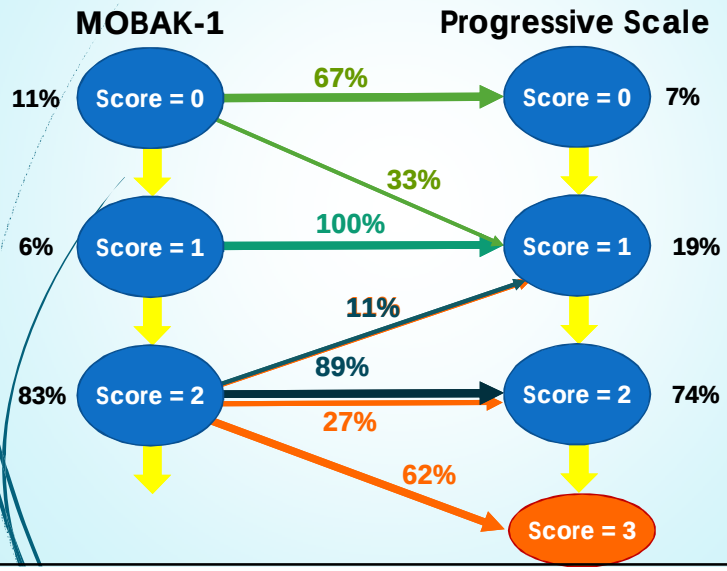


(Jidovtseff et al 2017, FIEP, Luxembourg)

Similar results

12

Catching test



13 Catching test : conclusion

- Task too easy and not discriminant
- Solution : catching with one hand ?

14 Bouncing test

Qualitative analysis

Developmental scale

MOBAK-1: entry test

Bouncing

If not able (score < 2)

Any control of the ball
Quick loss
→ Level 0

Inconstant control of the ball
Inconstant bounce
2 hands bouncing
Short stop
Loss after half distance
→ Level 1

If able to bounce (score = 2)

Bouncing + slalom

Fail to slalom → Level 2

MOBAK1 LIMIT

Able to slalom → Level 3

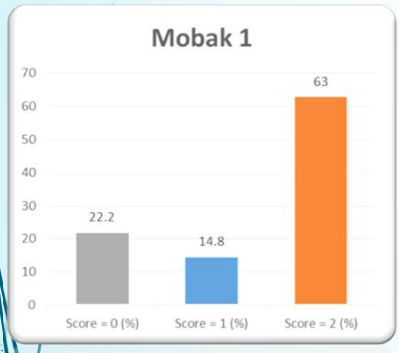
MOBAK-3 level

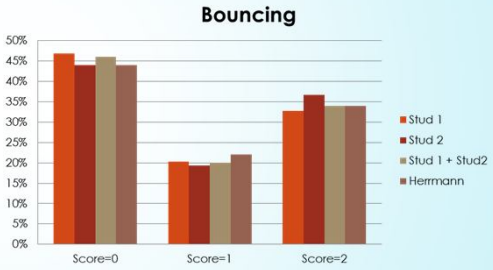
MOBAK-1 scoring system

2 success = 2 points
1 success = 1 point
0 success = 0 point

15

Bouncing test

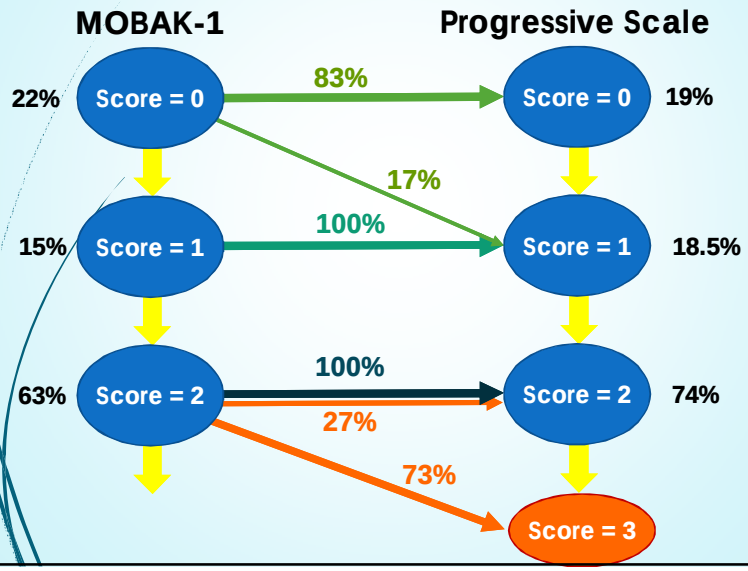




Increase in score 2 => linked to the familiarization ?

16

Bouncing test



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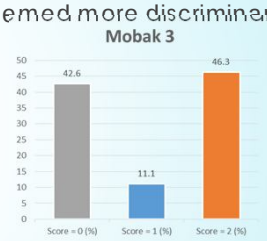
Bouncing test : conclusion

- Mobak-3 test (Bouncing + slalom) seemed more discriminent.



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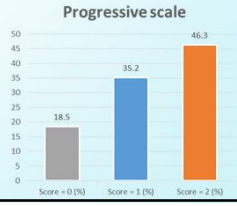
- Solution : progressive scale :
  - Level 0 : not able to bounce
  - Level 1 : able to bounce with one hand at least 5X in a line
  - Level 2 : able to do the slalom



?

18

Dribbling test

MOBAK-1: entry test

Dribbling

If not able (score < 2)

If able to dribble (score = 2)

MOBAK-1 scoring system

2 success = 2 points
1 success = 1 point
0 success = 0 point

Qualitative analysis

Developmental scale

Any control of the ball
Quick loss
Take ball with hands
→ Level 0

Inconstant control of the ball
Inconstant control
Short stop
Loss after half distance
→ Level 1

Good control of the ball
<5 touch

Bouncing + slalom

MOBAK-3 level

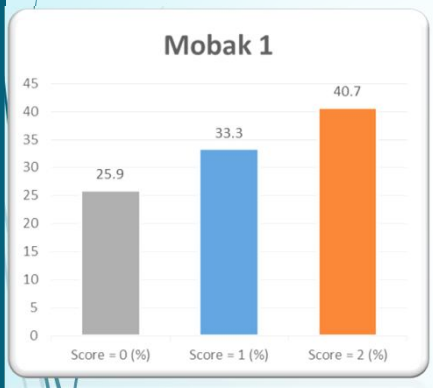
Fail to slalom → Level 2

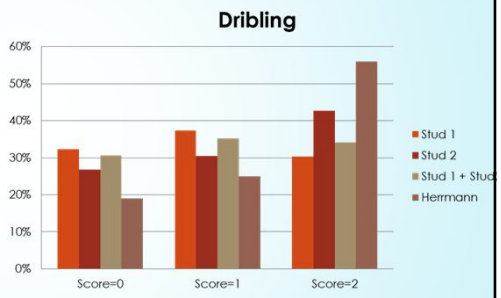
MOBAK1 LIMIT

Able to slalom → Level 3

19

Dribbling test

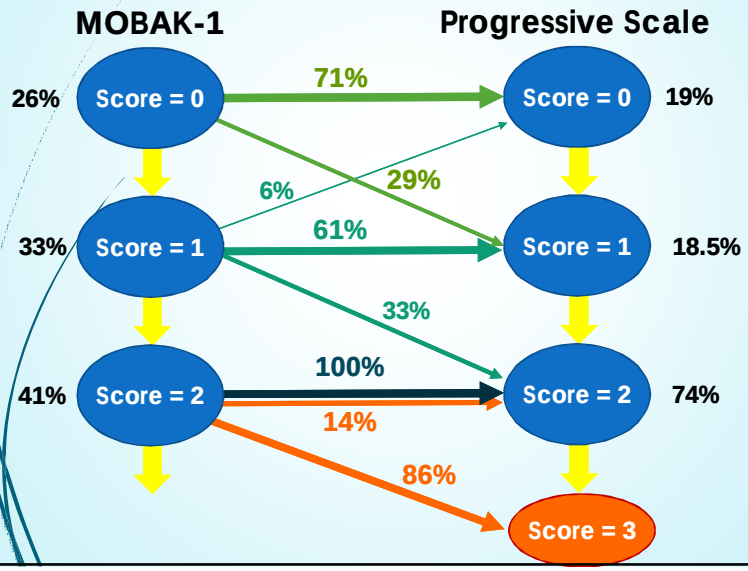




Similar results

20

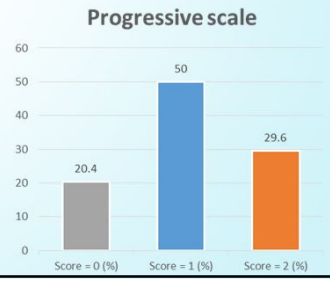
Dribbling test



21

Dribbling test : conclusion

- Quite good discrimination of Mobak-1 test
- Number of touch influence the results
- Progressive scale :
  - Level 0 : not able to dribble
  - Level 1 : able to dribble at least 5X in a line
  - Level 2 : able to do the slalom



22

Balance test

MOBAK-1: entry test

Balance

If score < 2
Stop
fall

If score = 2

MOBAK-1 scoring system

2 success = 2 points
1 success = 1 point
0 success = 0 point

Beam walking sequence of development

Developmental scale

Fail to walk → Level 0

Parrallel feet → Level 0

Same foot in the front → Level 1

Alternative steps
With 1 stop
With 1 fall → Level 1

At the end of the beam, children turn 180° and go back to the start line

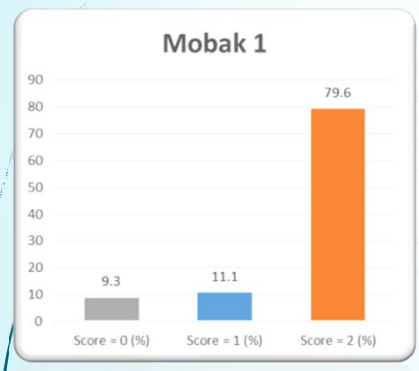
Fail to do it → Level 2

MOBAK1 LIMIT

Able to turn → Level 3

23

Balance test



Similar results

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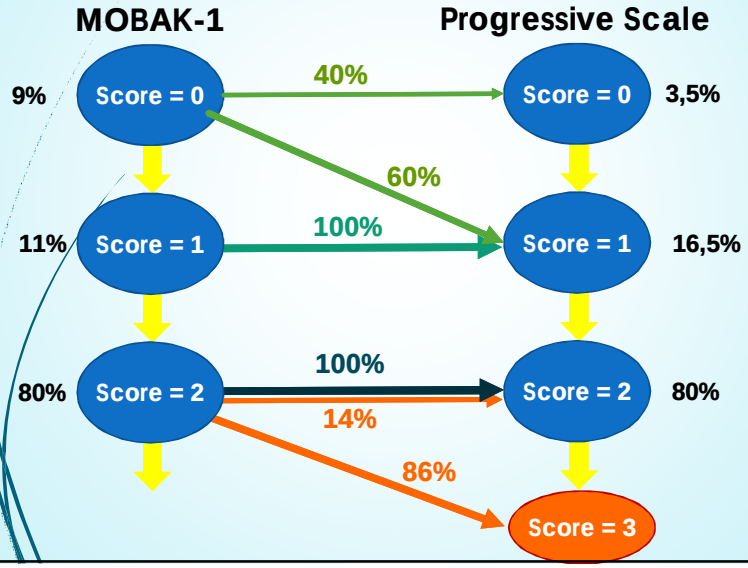
Balance test



25

Balance test : conclusion

- Task too easy and not discriminant
- Adding a 180° turn was not sufficient to increase discrimination
- Need to find a more discriminant task. To walk backward ?

26

Rolling test

MOBAK-1: entry test

Balance

If score < 2

If score = 2

MOBAK-1 scoring system

2 success = 2 points
1 success = 1 point
0 success = 0 point

Rolling sequence of development

Developmental scale

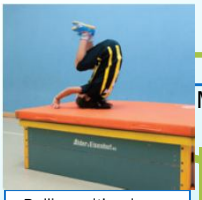
Not able to roll → Level 0

Ends on the back → Level 0

Ends sit → Level 1

Ends standing *With crossed legs* → Level 1

Ends standing *With arms push off* → Level 2



Rolling with a jump

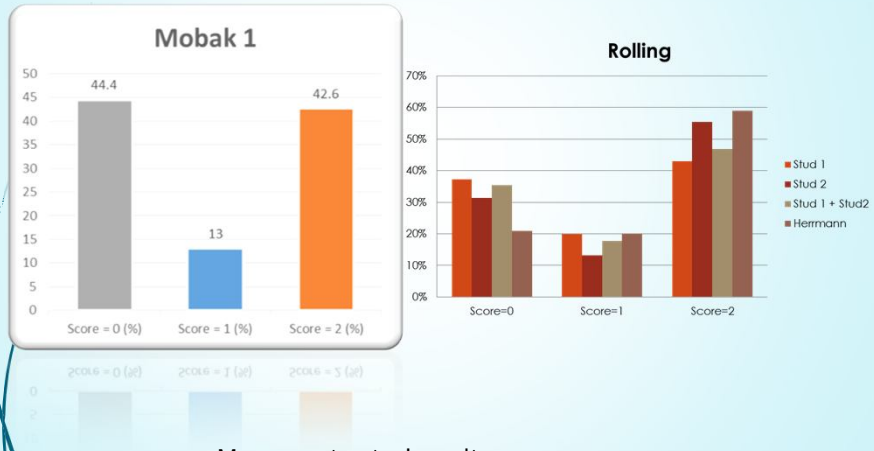
Fail to do it → Level 2

MOBAK1 LIMIT

Able to do it → Level 3

27

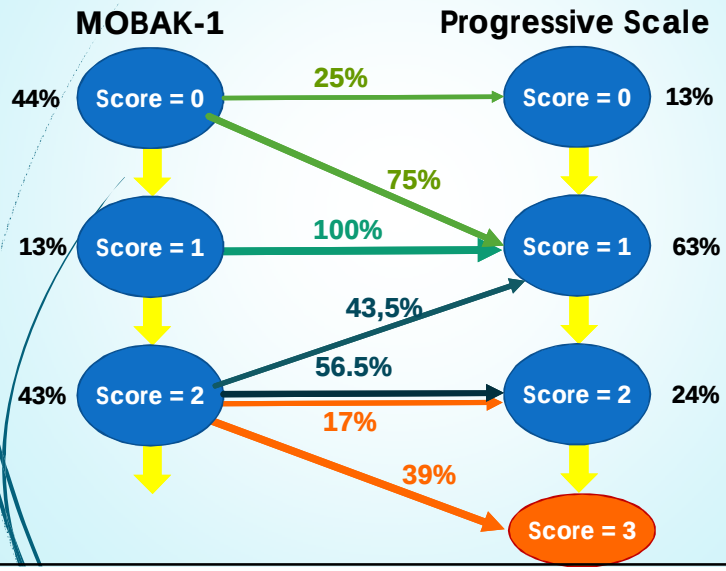
Rolling test



More contrasted results

28

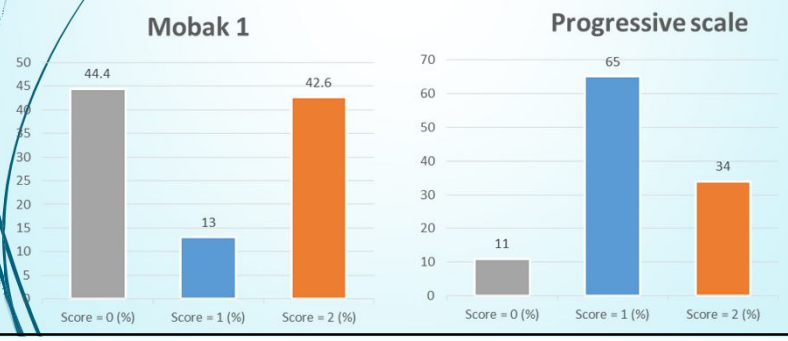
Rolling test



29

Rolling test : conclusion

- Important differences between dichotomous and progressive scale.
  - Level 0 = not able to roll or ends on the back
  - Level 1 = ends sit or with hands help
  - Level 2 = able to roll and to finish in the standing position without hands help



30

Jumping test

MOBAK-1: entry test

Jumping 2feet/1foot

If score < 2

If score = 2

If not able to do the 2F/1F exercise ? ⇒Invited to do the 2F/2F exercise

Developmental scale

Not able to do the 2F/2F exercise → Level 0

Able to do the 2F/2F exercise

Able to do 1x the 2F/1F exercise → Level 1

Able to do the exercise but touched the tiles

If able to do the 2F/1F exercise ? ⇒Invited to do the 2F/1F exercise with leg alternance

Fail to do it → Level 2

MOBAK1 LIMIT

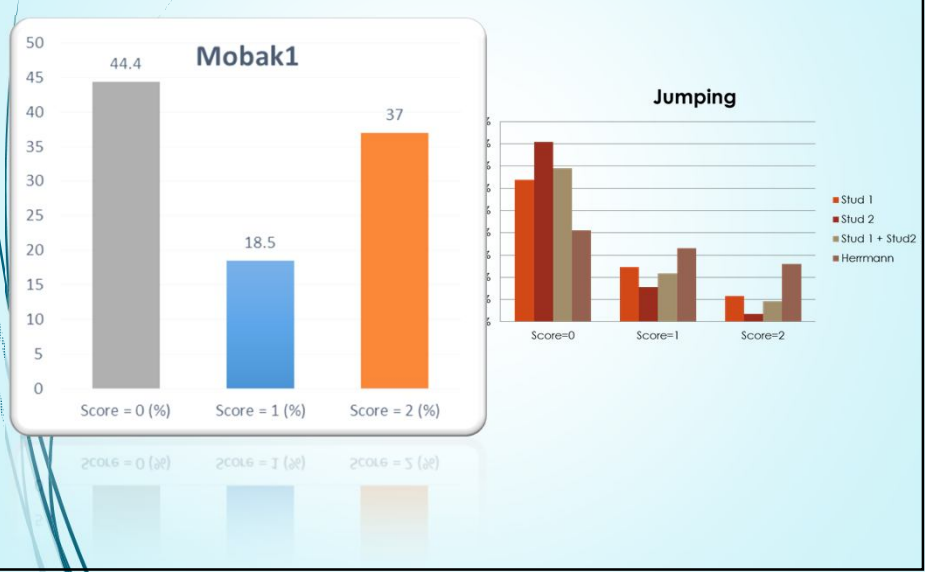
Able to do it → Level 3

MOBAK-1 scoring system

2 success = 2 points
1 success = 1 point
0 success = 0 point

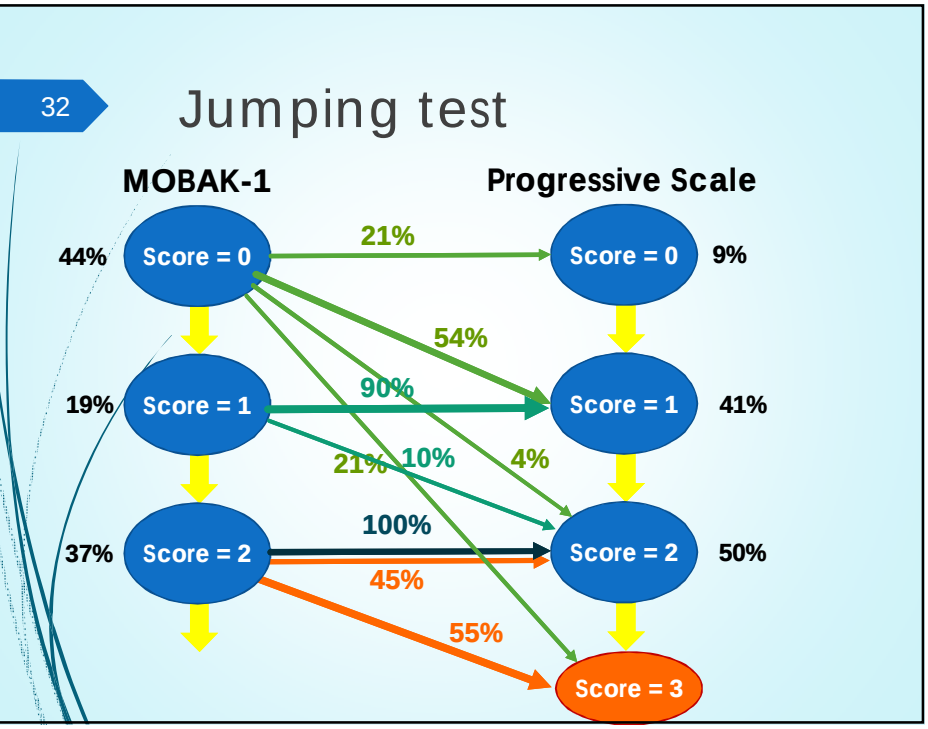
31

Jumping test



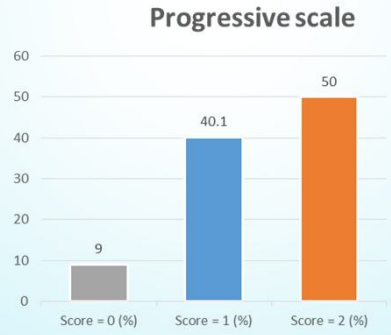
32

Jumping test

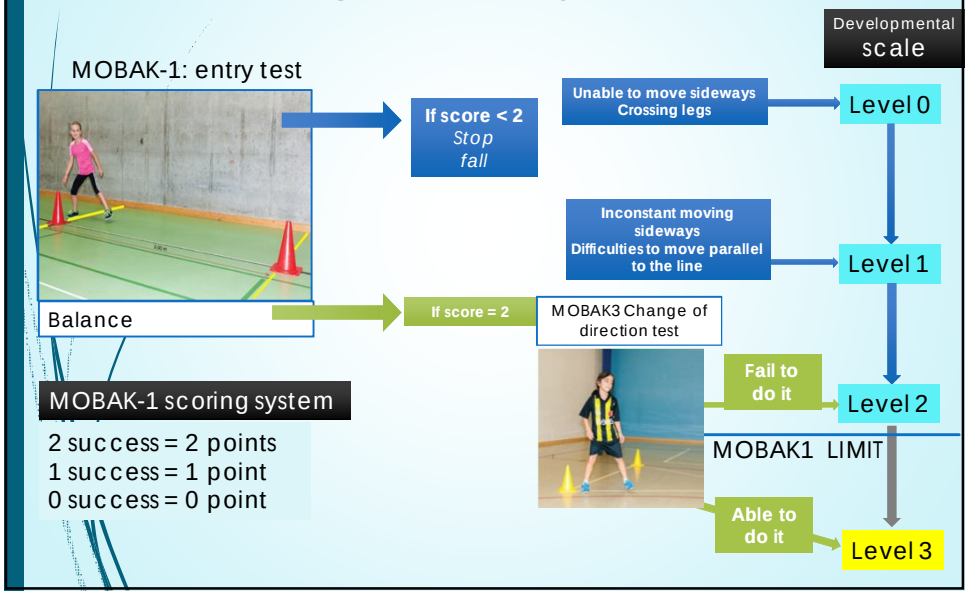


33 Jumping test : conclusion

- Importance of the familiarization
- Touching the tiles should not be a fault
  - Level 0 = not able to do 2F/2F task in a fluent way
  - Level 1 = able to do a 2F/2F task in a fluent way
  - Level 2 = able to do a 1F/2F task in a fluent way

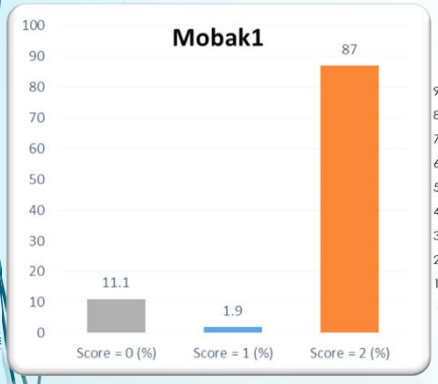


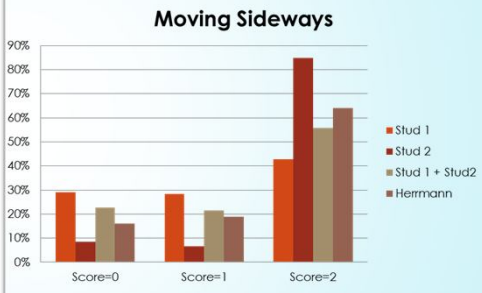
34 Moving sideways test



35

Moving sideway test





Similar to study 2

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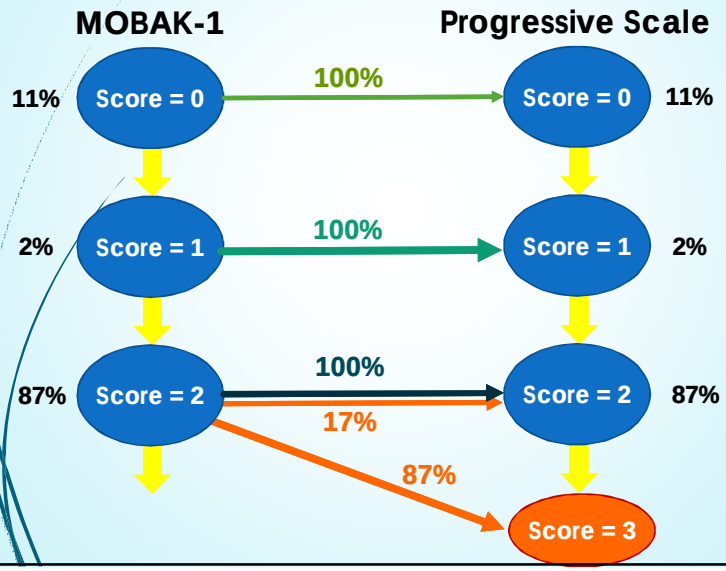
Moving sideways test



37 Moving sideways test: conclusion

- Task too easy to be discriminant
- Progressive scale was not relevant
- Measuring the time to do the task ?

38 Conclusions

- Importance of the familiarization
- Importance to have a complete description of the task, of the instruction and of the procedure
- Some small changes could improve discrimination
- *Developmental scale* is successfull to situate children in their development but takes more time and requires more expertise
- Pro and cons of both "dichotomous" and "developmental" scales should be discussed