

Convergent and divergent validity of the KTK and MOT 4-6 motor assessment batteries in pre-schoolers

Farid Bardid¹, Floris Huyben², Frederik J.A. Deconinck^{1,3}, Kristine De Martelaer², Jan Seghers⁴, Matthieu Lenoir¹

¹Dept. of Movement and Sports Sciences, Ghent University – ²Dept. of Movement and Sports Sciences, VU Brussels – ³School of Healthcare Science, Manchester Metropolitan University – ⁴Dept. of Kinesiology, KU Leuven

BACKGROUND AND STUDY PURPOSE

- **Motor competence** is the ability to perform a wide variety of motor skills.
- The development of motor competence during early childhood contributes to **proficiency in various sports and games**¹.
- The importance of motor competence has also been shown through **associations with several health outcomes**².
- However, a **decline in motor competence** of typically developing children has been observed in Western countries.
- These findings highlight the **need for valid and reliable test batteries** to evaluate and monitor young children.

The **purpose of the present study** was to investigate the convergent and divergent validity between two test batteries in pre-schoolers: the Körperkoordinationstest für Kinder (**KTK**)³ and the Motoriktest für Vier- bis Sechsjährige Kinder (**MOT 4-6**)⁴.

METHODS

PARTICIPANTS:

- 638 pre-schoolers aged 5 to 6 years (323♂; 315♀), were recruited from different settings (schools, sports clubs, day care centers).
- Settings were selected from all five Flemish provinces and the Brussels Capital Region.

PROCEDURE: Children performed two test batteries with a short break in between:

- [1] **MOT 4-6:** 18 test items.
- [2] **KTK:** 4 test items.

DATA ANALYSIS:

- **Descriptive statistics** were calculated for performances on the KTK (Motor Quotient) and MOT 4-6 (Motor Quotient, gross and fine motor component).
- **Spearman's rank correlations** were performed to examine the convergent and divergent validity between KTK and MOT 4-6 scores
- **Cohen's kappa statistics** were used to determine the level of classification between KTK and MOT 4-6 test batteries (based on their percentile cut-offs: P2, P16, P84 and P98).

Table 1: Descriptive statistics

Demographics	
Age (M ± SD)	5.94 ± 0.57
Proportion boys – girls (%)	50.6 – 49.4
Motor performance	
KTK Motor Quotient (M ± SD)	95.8 ± 14.4
MOT 4-6 Motor Quotient (M ± SD)	96.8 ± 14.3
MOT 4-6 Gross motor component (M ± SD)	16.8 ± 4.5
MOT 4-6 Fine motor component (M ± SD)	4.0 ± 1.5

REFERENCES

1. Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2012). *Understanding Motor Development: Infants, children, adolescents, adults* (7th ed.). New York: McGraw-Hill.
2. Stodden, D.F., Goodway, J.D., Langendorfer, S.J., Roberton, M.A., Rudisill, M.E., Garcia, C. & Garcia, L.E. (2008). A developmental perspective on the role of motor skill competence in physical activity: An emergent relationship. *Quest*, 60 (2), 290-306.
3. Kiphard, E.J., & Schilling, F. (1974). *Körperkoordinationstest für Kinder*. Weinheim: Beltz Test.
4. Zimmer, R., & Volkamer, M. (1987). *Motoriktest für vier- bis sechsjährige Kinder*. Weinheim: Beltz Test.

RESULTS

- A moderate correlation was observed between KTK and MOT 4-6 Motor Quotient.
- The KTK Motor Quotient demonstrated stronger associations with MOT 4-6 gross motor component than with MOT 4-6 fine motor component.

Table 2: Spearman's rank correlations between the KTK and MOT 4-6 scores.

	KTK Motor Quotient	
	r _s	p
MOT 4-6 Motor Quotient	0.63	<0.001
MOT 4-6 Gross motor component	0.62	<0.001
MOT 4-6 Fine motor component	0.32	<0.001

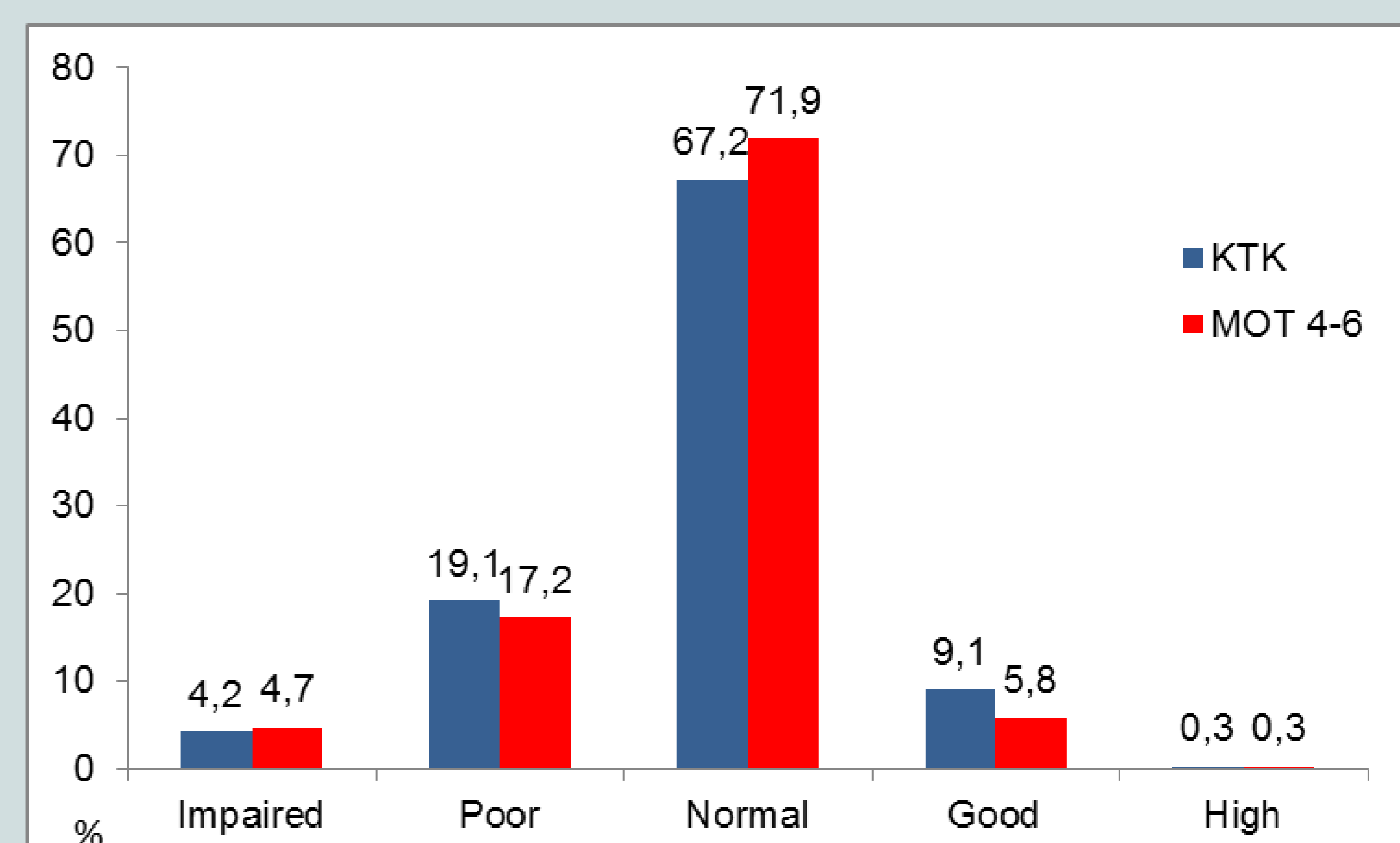


Fig 1. Proportions of children across classification categories of KTK and MOT 4-6.

- Cohen's kappa indicates moderate levels of agreement for P2 and P16, but low agreement for P84 and no agreement for P98.

Table 2: Cohen's kappa analysis between the KTK and MOT 4-6 for percentile cut-offs.

	k	p
P2	0.50	<0.001
P16	0.52	<0.001
P84	0.23	<0.001
P98	0.00	0.937

CONCLUSIONS

- Convergent and divergent validity of the KTK and MOT 4-6 was established.
- Agreement of classification was moderate for identification of motor problems and low for identification of motor excellence.
- Practitioners should be aware of possible categorisation errors when using the KTK or MOT 4-6 to measure motor competence.
- Findings indicate the need for at least two test batteries when evaluating the motor behaviour of young children.

PARTNERS

Vlaamse Sportfederatie – Instituut voor Recreatiebeheer en Sportbeleid – Vlaamse Trainersschool – Bloso. This work was completed during a project ("Multimove for Kids") funded by the Flemish Government.

E-MAIL: farid.bardid@ugent.be