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

Farid Bardid¹, Floris Huyben², Frederik J.A. Deconinck¹,3, Kristine De Martelaer², Jan Seghers⁴, Matthieu Lenoir¹

1 Dept. of Movement and Sports Sciences, Ghent University – 2 Dept. of Movement and Sports Sciences, VU Brussels – 3 School of Healthcare Science, Manchester Metropolitan University – ⁴ Dept. 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 games¹.
- The importance of motor competence has also been shown through associations with several health outcomes².
- 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).

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.

<table>
<thead>
<tr>
<th></th>
<th>KTK Motor Quotient</th>
<th>MOT 4-6 Motor Quotient</th>
<th>MOT 4-6 Gross motor component</th>
<th>MOT 4-6 Fine motor component</th>
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<td></td>
<td>ρ</td>
<td>p</td>
<td>ρ</td>
<td>p</td>
</tr>
<tr>
<td>MOT 4-6 Motor Quotient</td>
<td>0.63</td>
<td>&lt;0.001</td>
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<tr>
<td>MOT 4-6 Gross motor component</td>
<td>0.62</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
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<tr>
<td>MOT 4-6 Fine motor component</td>
<td>0.32</td>
<td>&lt;0.001</td>
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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.

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<tbody>
<tr>
<td></td>
<td>k</td>
<td>p</td>
</tr>
<tr>
<td>P2</td>
<td>0.50</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>P16</td>
<td>0.52</td>
<td>&lt;0.001</td>
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<tr>
<td>P84</td>
<td>0.23</td>
<td>&lt;0.001</td>
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<tr>
<td>P98</td>
<td>0.00</td>
<td>0.937</td>
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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.

REFERENCES

PARTNERS
Vlaamse Sportfederatie – Instituut voor Recreatiebeheer en Sportbeleid – Vlaamse Trainingschool – Blosso. This work was completed during a project (“Multimove for Kids”) funded by the Flemish Government.

E-MAIL: farid.bardid@ugent.be