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Citation:

Burton, A and Cowburn, IHJ and Thompson, F and Eisenmann, J and Nicholson, B and Till, K (2022) Associations between motor competence and physical activity, physical fitness, and psychosocial characteristics in adolescents: a meta-analysis. In: National Strength and Conditioning Association National Conference 2022, 6 - 9 July 2022, New Orleans, LA.

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Associations between motor competence and physical activity, physical fitness, and psychosocial characteristics in adolescents: a meta-analysis

Alan M. Burton, Ian Cowburn, Ffion Thompson, Joey C. Eisenmann, Ben Nicholson, Kevin Till



AB__Coaching



A.M.Burton@leedsbeckett.ac.uk

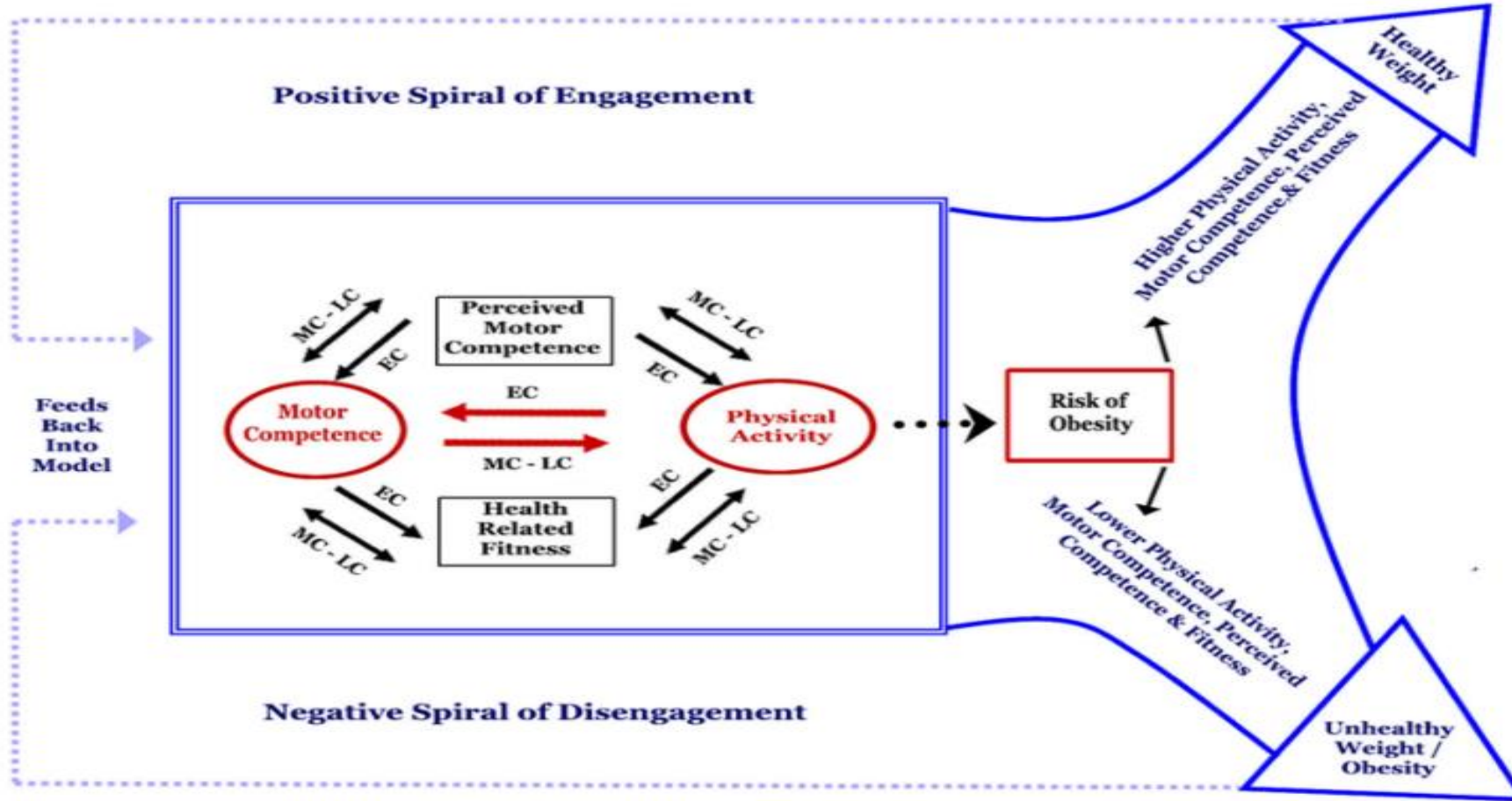


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Background



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Stodden et al., 2008



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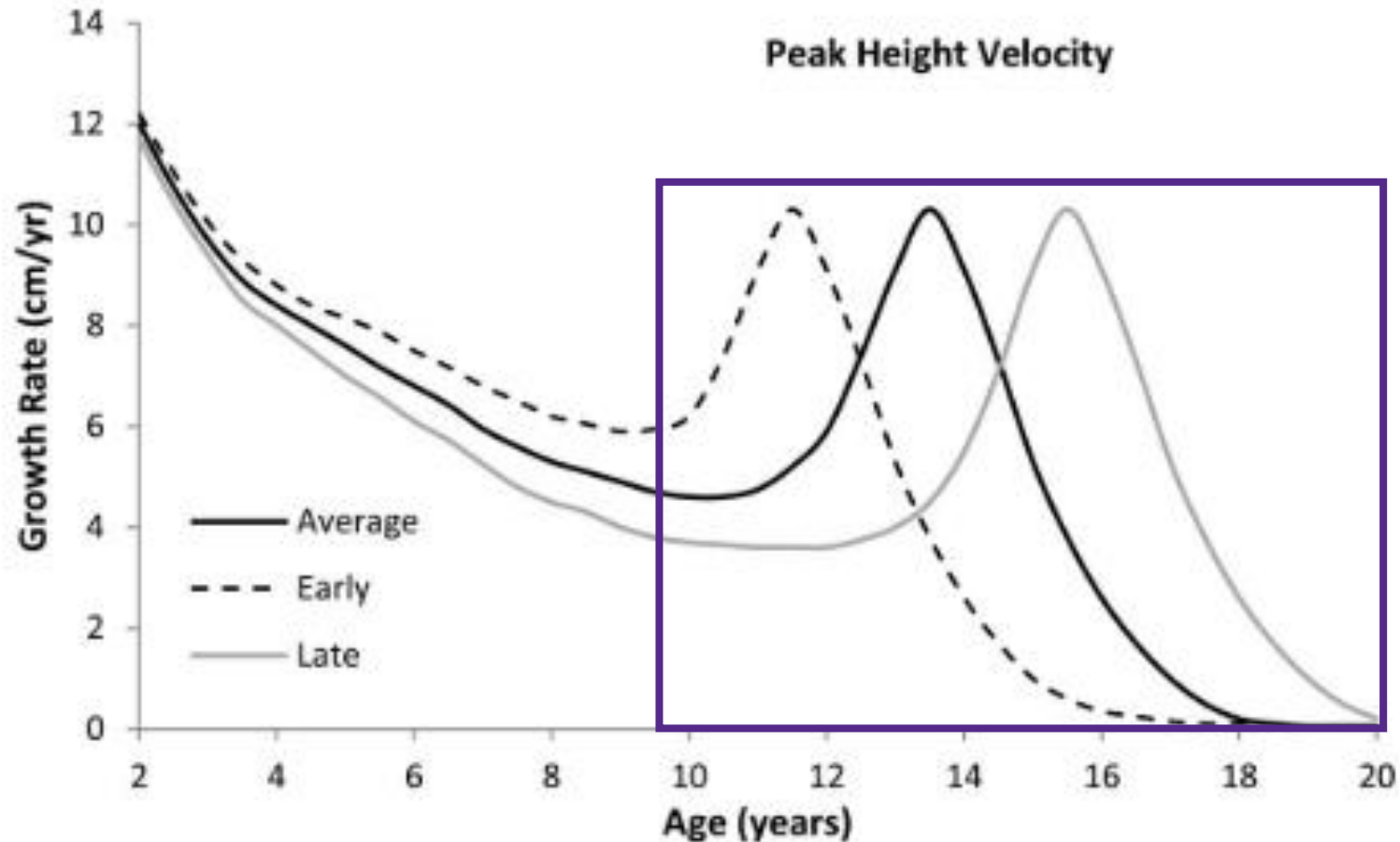
Background

Sports Med (2016) 46:1663–168;
DOI 10.1007/s40279-016-0495-z

SYSTEMATIC REVIEW

Correlates of Growth and Adolescents:

Lisa M. Barnett¹ · Samuel Dylan P. Cliff² · Philip J. I. Sarah P. Shultz³ · Nicola I. Anthony D. Okely²



Lloyd et al., 2014 (adapted from Stratton and Oliver 2013)



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An De Meester^{1,2} · Lisa M. Barnett³ · Ali Brian¹ · Steven J. Bowe⁴ · Judith Jiménez-Díaz⁵ · Femke Van Duyse² · J. Megan Irwin^{1,6} · David F. Stodden¹ · Eva D'Hondt⁷ · Matthieu Lenoir² · Leen Haerens²

Reference
NEW

Research aims

1. Analyse the scientific literature.
2. Evaluate the associations between motor competence and physical activity, physical fitness characteristics, and/or psychosocial characteristics amongst adolescents.
3. Investigate the impact of moderator variables (i.e., age, sex, type of motor competence assessment) on associations.



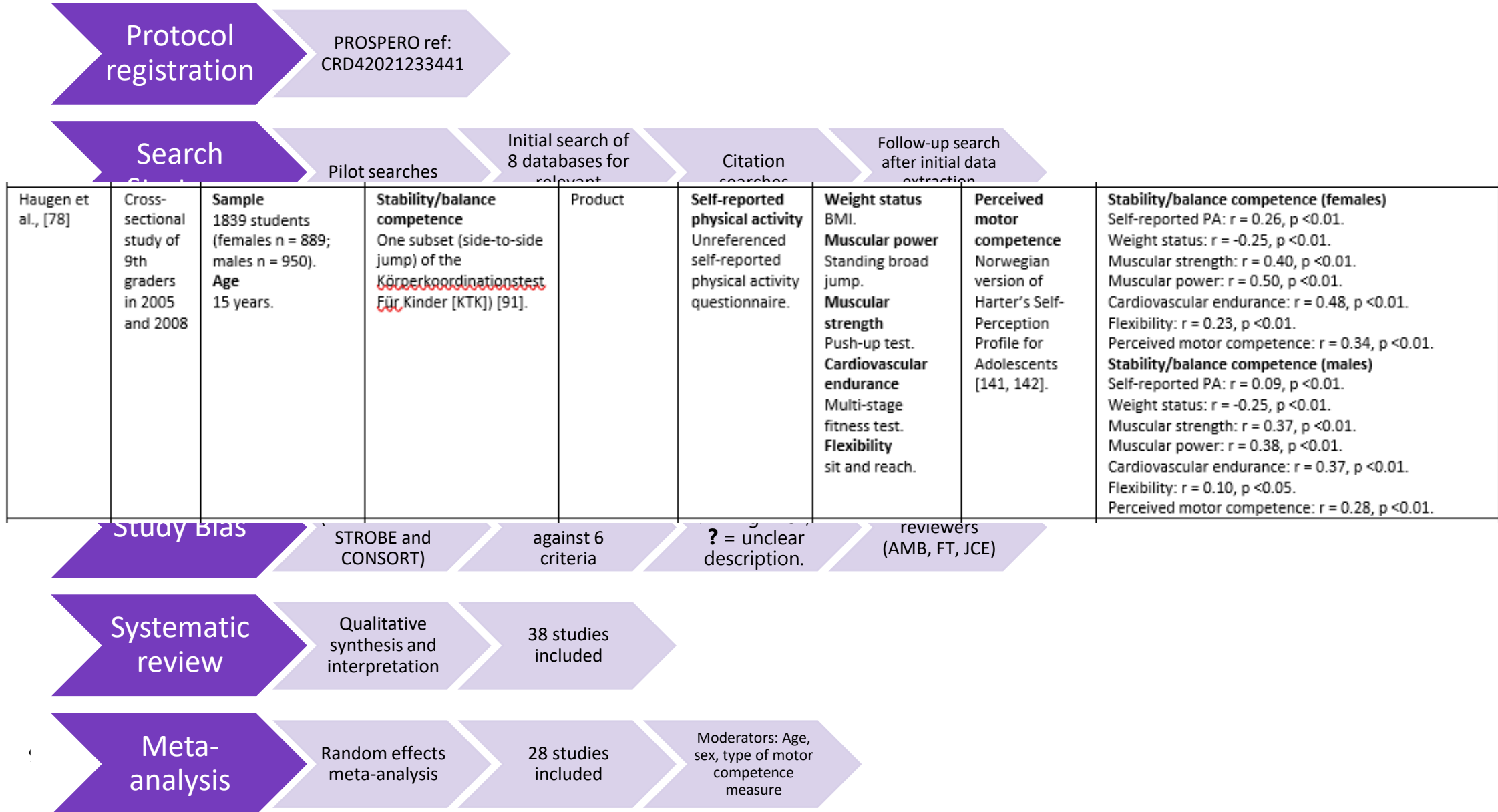
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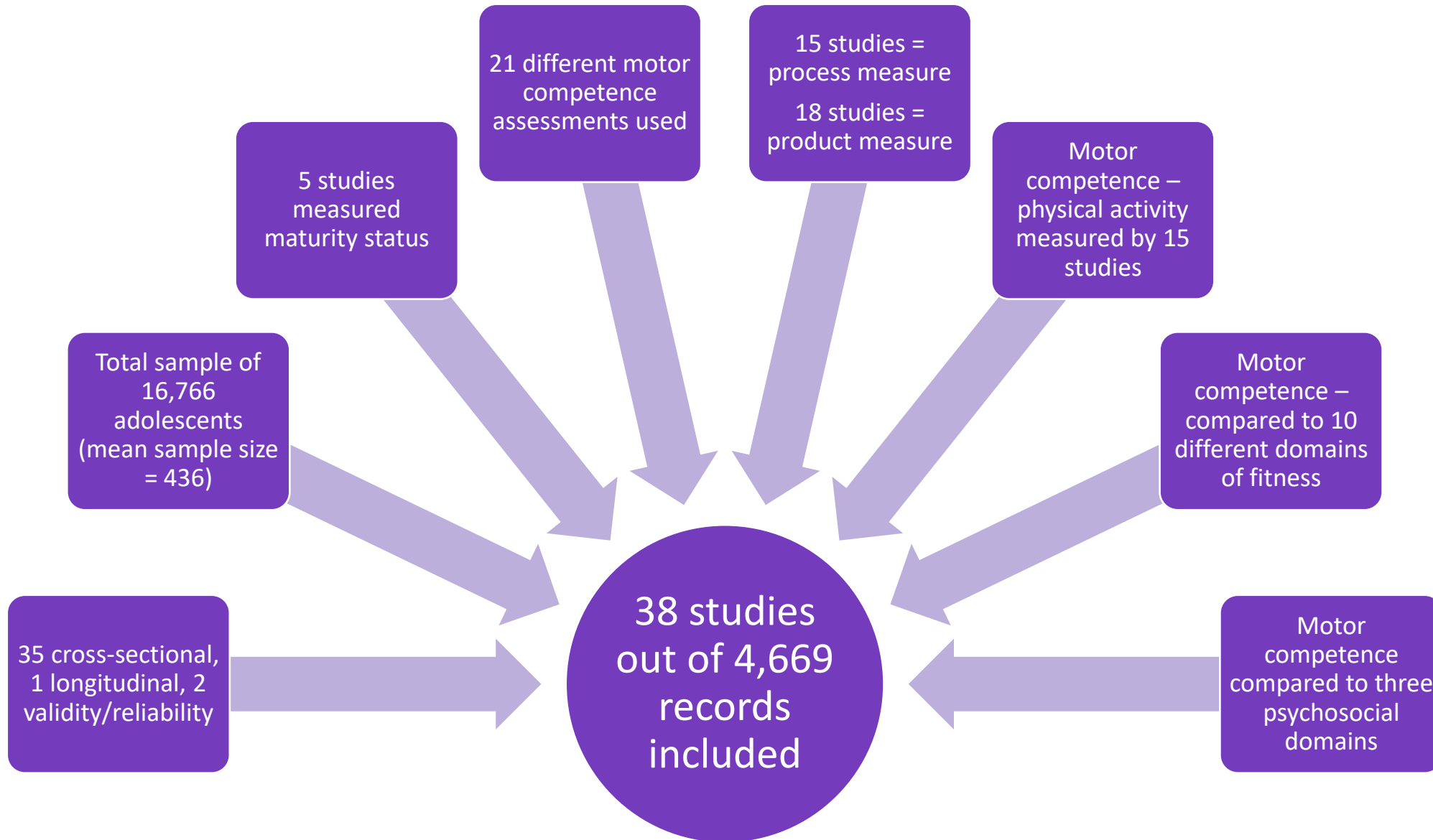
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Methods



Results (systematic review)



Psychosocial

Perceived Motor Competence
Motivation

$r = 0.24$ to 0.33
 $r = 0.07$ to 0.20

- Ps
- Perceived moti
 $r = 0.24$ to 0.33
 - Motivation:
 $r = 0.07$ to 0.20

0.36
 13
 0.35 to 0.41
urance:
 $r = -0.07$ to 0.24

Model	Studies (n)	Study samples (n)	Sample size (n)	Pooled correlation coefficients ($r \pm 95\% \text{ CI}$)	p value
Locomotor competence	3	4	616	0.10 (0.02, 0.18)	0.01
Object control competence	4	8	4,254	0.25 (0.14, 0.35)	<0.01
Overall competence	5	10	4,688	0.21 (0.09, 0.32)	<0.01
Stability/balance competence	1	0	5,978	0.11 (0.01, 0.21)	0.01

Motor competence and composite fitness score	Sex	Overall competence Females vs. males $p = 0.43$	Overall competence Females (Studies $n = 3$; sample size $n = 120$; $r = 0.40$; 95% CI [0.24, 0.55]; $p < 0.01$) Males (Studies $n = 4$; sample size $n = 175$; $r = 0.49$; 95% CI [0.30, 0.64]; $p < 0.01$)
	Age	Overall competence 11-12 years vs. 13-15 years $p = 0.01$	Overall competence 11-12 (Studies $n = 3$; sample size $n = 107$; $r = 0.60$; 95% CI [0.46, 0.71]; $p < 0.01$) 13-15 (Studies $n = 5$; sample size $n = 251$; $r = 0.37$; 95% CI [0.25, 0.47]; $p < 0.01$) 16+ (N/A)
	Assessment type	Overall competence ^a Process vs. Product	Overall competence Combined (N/A) ^a Process (Studies $n = 1$; sample size $n = 63$; $r = 0.40$; 95% CI [0.17, 0.59]; $p < 0.01$) Product (Studies $n = 7$; sample size $n = 295$; $r = 0.46$; 95% CI [0.34, 0.56]; $p < 0.01$)

Heterogeneity (stability/balance competence): $I^2 = 78.85$; $Q = 18.89$; $\tau^2 = 0.01$ and $df = 4$

Figure 14. Forest plots showing the pooled correlation coefficients between motor competence and perceived motor competence ($r \pm 95\% \text{ CI}$). Bold font = $p < 0.05$, r = pooled correlation coefficient, and CI = confidence interval.



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Conclusion

→ Findings support the hypothesised interactions of motor competence with physical activity, physical fitness and psychosocial characteristics in adolescence.

→ Methodological approaches vary considerably across studies...

→ Limitations of the current literature:

- Inadequate assessment of motor competence.
- A lack of longitudinal observations.
- Failure to account for biological maturation within data analysis.



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Practical applications

Research

- **Longitudinal assessments** are required.
- **Utilise combined tools** (i.e., process and product) to assess motor competence.
- **Implement better field-based measures** across all characteristics (e.g., body composition over BMI).
- **Consider** how different **moderators** (especially stage of maturity) effects any associations.

Practice

- Adolescent health-related interventions should focus on **synergistic development** of **motor competence, physical activity engagement, physical fitness, and psychosocial characteristics**.



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What's next?

- Holistic measurement of motor competence, physical activity, physical fitness, and psychosocial characteristics amongst adolescents.
- Initial cross-sectional with a later follow up (start and end of the school year).
- Dragon's challenge (Tyler et al., 2018) – process AND product assessment.
- Influence of maturity status on associations.



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Thank you

Open to discussions in this area (and others)...



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A.M.Burton@leedsbeckett.ac.uk