

# Exploring Predictors of Children's Motor Competence within the Context of the Canadian Assessment of Physical Literacy (CAPL)

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## BACKGROUND

- Physical literacy is "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life".<sup>1</sup> It is an important component of acquiring the knowledge, skills, and attitudes that are essential for participation in long term physical activity and sport.<sup>2</sup>
- Age is a positive correlate of motor competence (object control, locomotor, and stability).<sup>2</sup> Further, motor competence has a positive relationship with cardiorespiratory endurance and muscular strength/endurance, which tends to strengthen as children get older.<sup>3</sup>
- There is limited literature investigating motor skill correlates in children and adolescents, more specifically exploring the roles of various correlates, the strength of the relationships across time, and the direction of these associations.<sup>3,4</sup>

## PURPOSE

- To explore the relationship among components of children's physical literacy with a focus on motor competence, specifically object control and locomotor skills.

## METHODS

### Participants

- Children from Northeastern Ontario (n = 1137; 52% F; M<sub>age</sub> = 9.76, SD = 1.28) participated in the standardized CAPL<sup>5,6,7</sup> protocol measuring physical competence (PACER run, Canadian Agility and Movement Skill Assessment (CAMSA),<sup>8</sup> grip strength, plank, BMI, waist circumference, sit and reach), daily behavior (pedometer wear and questionnaire), motivation/confidence (questionnaire), and knowledge/understanding of physical activity (questionnaire).

### Measures and Procedures

- Motor competence were assessed by the CAMSA,<sup>8</sup> a standardized obstacle course that includes both object control and locomotor skills (Figure 1).
- Skills were assessed by trained raters and children's ability to meet skill-related criteria associated with proficient performance for each skill was used to create an average score for object control (max 5 points/trial) and locomotor skills (max 9 points/trial) from 2 timed trials.

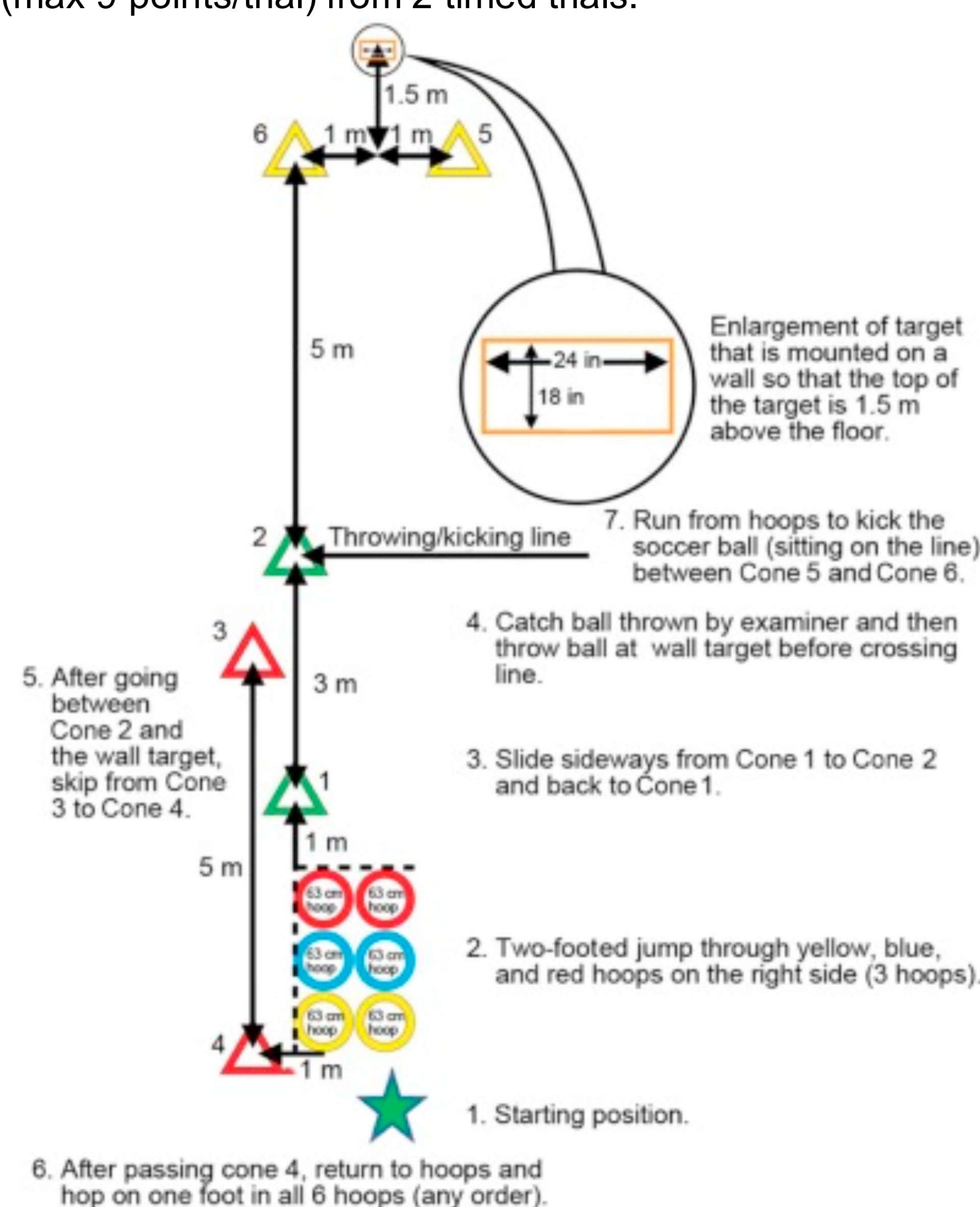


Figure 1. Canadian Agility and Movement Skill Assessment (CAMSA) schematic. Children start at the hoops and work their way through the cones in numbered order before going through the hoops a second time.

## RESULTS

### Age & Gender Effects

- A 2(Gender) x 5(Age) MANOVA was conducted separately for object control and locomotor skills.

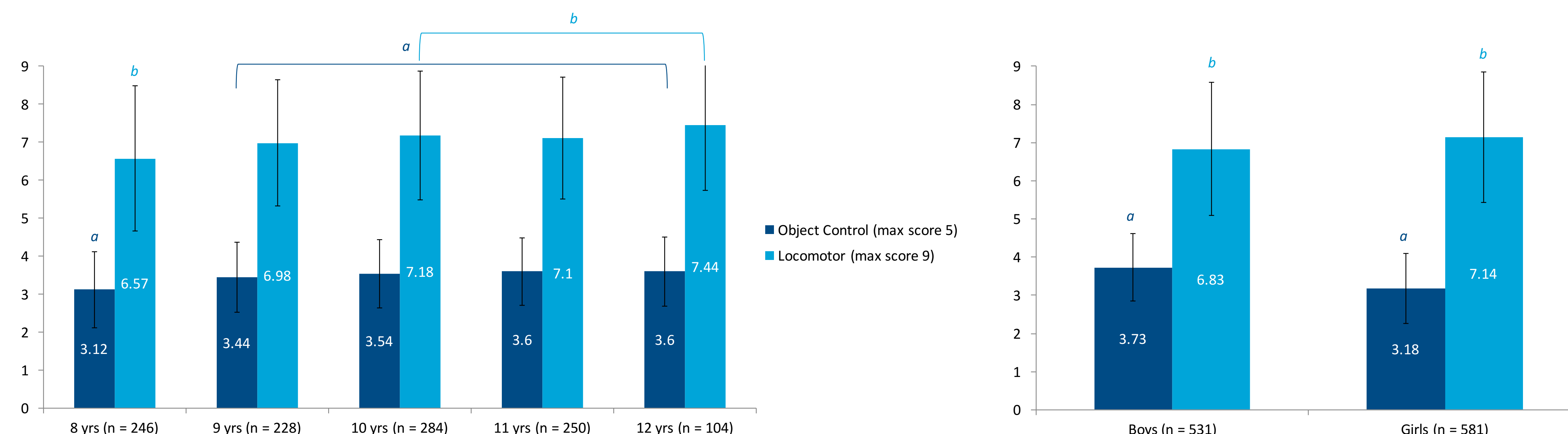


Figure 2. Age effects on motor competence.

Bars with the same superscripts are significantly different ( $p < .05$ ). Main effect for age: Pillai's Trace = .239,  $F(12, 3306) = 23.86$ ,  $p < .0001$ ,  $\eta^2 = .238$

Figure 3. Gender effects on motor competence.

Bars with the same superscripts are significantly different ( $p < .05$ ). Main effect for gender: Pillai's Trace = .119,  $F(3, 1100) = 49.49$ ,  $p < .0001$ ,  $\eta^2 = .119$

### Physical Literacy Components Predicting Object Control & Locomotor Skills

- Hierarchical multiple regression analyses were conducted to examine which measures positively predicted motor competence. Age and gender were entered at step 1, with the remaining variables entered at step 2. Separate regressions were done for object control and locomotor skills.

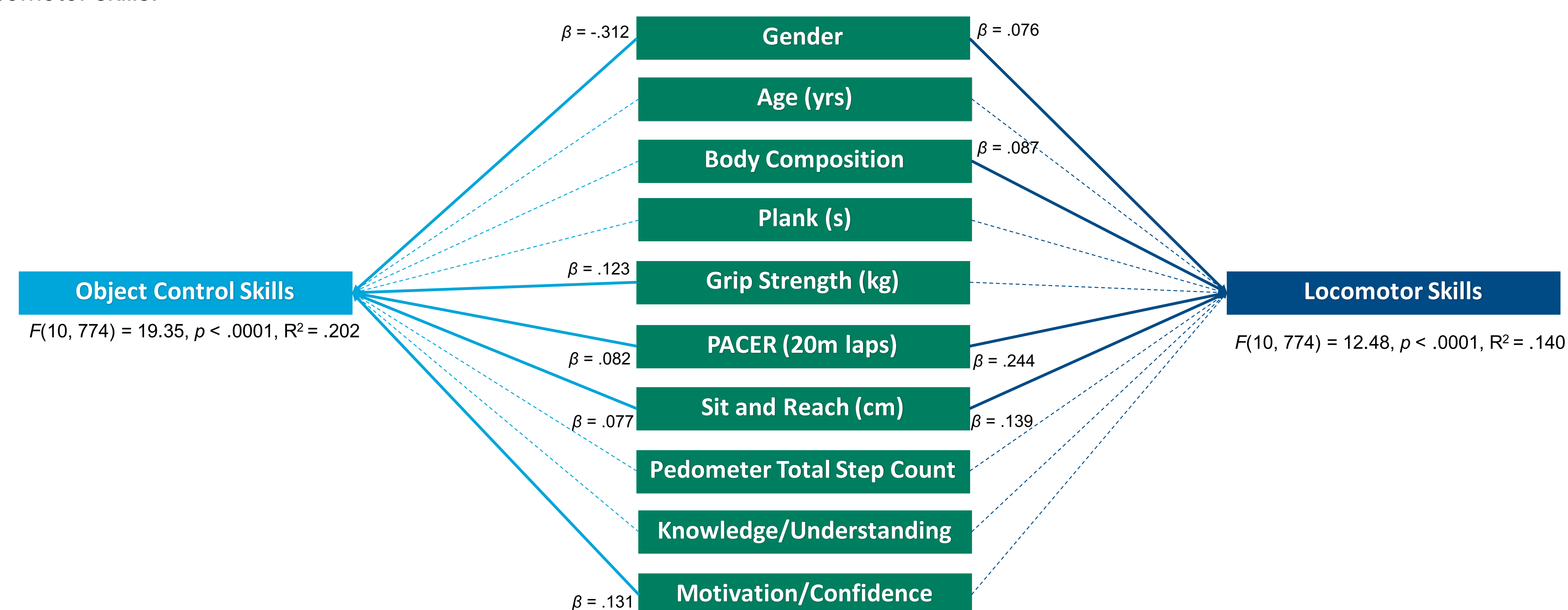


Figure 4. Physical literacy components predictive of motor skill competence.

Solid lines represent significant predictors ( $p < .05$ ); dashed lines represent non-significant contributors to the model.

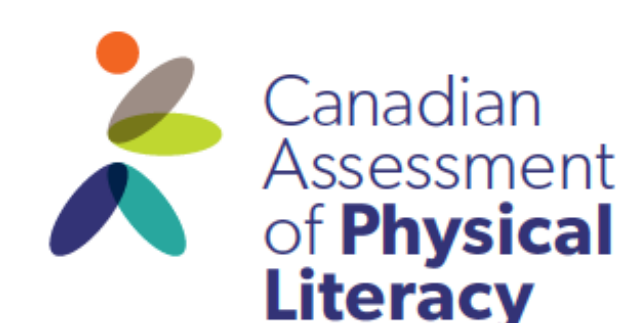
## DISCUSSION AND CONCLUSION

- Findings align with previous studies that suggest motor competence tends to increase with age.<sup>3,4</sup> The results of this study show that as the children get older, an upward trend was seen for object control and locomotor skills scores.
- Results also support literature highlighting that gender is related to certain aspects of motor competence, with boys having stronger object control skills.<sup>3</sup> Therefore, it is important to develop strategies and opportunities that enhance young girls' object control skills.
- Previous physical literacy research shows that competence in fundamental movement skills is both predictive and correlated to physical activity, fitness, body weight status, and cognitive/academic outcomes.<sup>9</sup> The results of this study extend this work by suggesting which physical literacy components may be predictive of different types of motor skills (i.e., object control vs. locomotor).
- Overall, the findings indicate that different components of physical literacy are related to children's performance on object control and locomotor skills. Further longitudinal research is merited to examine these relationships over time.

## REFERENCES

- Whitehead, M. (2013). Definition of physical literacy and clarification of related issues. *ICSSPE Bulletin*, 65(1.2).
- Physical and Health Education Canada. (2010). What is the relationship between Physical Education and Physical Literacy? [Brochure]. Retrieved from [http://www.phcanada.ca/sites/default/files/PL\\_and\\_PE.pdf](http://www.phcanada.ca/sites/default/files/PL_and_PE.pdf).
- Barnett, L.M., Lai, S.K., Veldman, S.L., Hardy, L.L., Cliff, D.P., Morgan, P.J., Zask, A., Lubans, D.R., Shultz, S.P., Ridgers, N.D. and Rush, E. (2016). Correlates of gross motor competence in children and adolescents: a systematic review and meta-analysis. *Sports Medicine*, 46(11), 1663-1688.
- Robinson, L. E., Stodden, D. F., Barnett, L. M., Lopes, V. P., Logan, S. W., Rodrigues, L. P., & D'Hondt, E. (2015). Motor competence and its effect on positive developmental trajectories of health. *Sports Medicine*, 45(9), 1273-1284.
- Longmuir, P. E., Boyer, C., Lloyd, M., Yang, Y., Boiarskaia, E., Zhu, W., & Tremblay, M. S. (2015). The Canadian Assessment of Physical Literacy: methods for children in grades 4 to 6 (8 to 12 years). *BMC Public Health*, 15, 767. <http://doi.org/10.1186/s12889-015-2106-6>.
- Healthy Active Living and Obesity Research Group (HALO) (2014) The Canadian Assessment of Physical Activity (CAPL) Manual., Ottawa, ON. Available at <https://www.capl-ecsfp.ca/wp-content/uploads/capl-manual-english.pdf>.
- Longmuir, P. E. (2013). Understanding the physical literacy journey of children: The Canadian Assessment of Physical Literacy. *ICSSPE BULLETIN-J Sport Sci Phys Educ*, 65(October), 12-1.
- Longmuir, P. E., Boyer, C., Lloyd, M., Borghese, M. M., Knight, E., Saunders, T. J., T. J., Boiarskaia, E., Zhu, W. & Tremblay, M. S. (2015). Canadian Agility and Movement Skill Assessment (CAMSA): Validity, objectivity, and reliability evidence for children 8-12 years of age. *Journal of Sport and Health Science*.
- Barnett, L. M., Stodden, D., Cohen, K. E., Smith, J. J., Lubans, D. R., Lenoir, M., Iivonen, S., Miller, A.D., Laukkanen, A., Dudley, D. and Lander, N.J., (2016). Fundamental movement skills: An important focus. *Journal of Teaching in Physical Education*, 35(3), 219-225.

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