

Table 2. Evidence synthesis of high quality studies on physical activity intervention effects on academic and cognitive performance

Study (lead author, year of publication) Contrast intervention/control group (duration/intensity or type of PA)	Results cognitive performance (CP)	Total # of CP constructs**	Results academic performance (AP)	Total # of AP measures*
<p>Ahamed et al., 2007</p> <p>Intervention: Regular PE + 15 min 5 days/week classroom-based PA</p> <p>Control: Regular PE (2 x 40 min)</p>	Not applicable	-	<u>Canadian Achievement Test</u> intervention = control	0/1
<p>Chaya et al., 2012</p> <p>Intervention: Yoga; 45 min; 6 days/week</p> <p>Control: Passive stretching and aerobic exercise; 45 min; 6 days/week</p>	<p>Malin's Intelligence Scale (7 constructs)</p> <p><u>Comprehension</u> intervention = control</p> <p><u>Arithmetic</u> intervention = control</p> <p><u>Analogies</u> intervention = control</p> <p><u>Vocabulary</u> intervention = control</p> <p><u>Block design</u> intervention = control</p> <p><u>Object assembly</u> intervention = control</p> <p><u>Coding</u> intervention = control</p>	0/7	Not applicable	-

<p>Donnelly et al., 2009</p> <p>Intervention: Regular PE and active academic lessons (5 days/week; 10 min MVPA)</p> <p>Control: Regular PE and academic lessons</p>	<p>Not applicable</p>	<p>-</p>	<p>Wechsler Individual Achievement Test <u>Mathematics</u> intervention > control <u>Reading</u> intervention > control <u>Spelling</u> intervention > control</p>	<p>3/3</p>
<p>Ericsson, 2008</p> <p>Intervention: Daily PE; 45 min</p> <p>Control: Regular PE (2 x 45 min)</p>	<p><u>Attention (1 construct, measured 3 times)</u> 1 year: intervention > control 2 year: intervention > control 3 year: intervention = control</p> <p><u>Impulse control (1 construct, measured 3 times)</u> 1 year: intervention > control 2 year: intervention > control 3 year: intervention = control</p>	<p>4/6</p>	<p><u>Literacy Swedish</u> 1 year: intervention > control 2 year: intervention > control 3 year: intervention = control</p> <p><u>Mathematics</u> 1 year: intervention > control 2 year: intervention > control</p> <p><u>Qualification upper school after 9 years:</u> intervention > control</p>	<p>5/6</p>
<p>Gao et al., 2013</p> <p>Intervention: Structured recess 2x 15 min (aerobic exercises; dancing); 3 days/week</p> <p>Control:</p>	<p>Not applicable</p>	<p>-</p>	<p><u>Reading</u> 1 year: intervention = control 2 year: intervention = control</p> <p><u>Mathematics</u> 1 year: intervention > control 2 year: intervention > control</p>	<p>2/4</p>

Unstructured recess				
<p>Hillman et al., 2014</p> <p>Intervention: Daily 70 min (combination aerobic/skills; light to MVPA); 5 days/week</p> <p>Control: Regular PE</p>	<p><u>Attention inhibition (1 construct, 2 aspects)</u> Accuracy: intervention > control Response time: intervention = control</p> <p><u>Cognitive flexibility (1 construct, 2 aspects)</u> Heterogeneous trials: intervention > control Homogeneous trials: intervention = control</p>	2/2	Not applicable	-
<p>Kirk et al., 2014</p> <p>Intervention: Regular PE and active academic lessons (5 days/week; 2x15 min light to MVPA)</p> <p>Control: Regular PE and academic lessons</p>	Not applicable	-	<p><u>Picture naming</u> 3 months: intervention > control 6 months: intervention > control</p> <p><u>Rhyming</u> 3 months: intervention = control 6 months: intervention = control</p> <p><u>Alliteration</u> 3 months: intervention > control 6 months: intervention > control</p>	4/6

<p>Resaland et al., 2016</p> <p>Intervention (3 components): a) 90 min/week physically active educational lessons in school playground b) 5 min/day PA breaks during classroom lessons c) 10 min/day PA homework Intensity: 25% of PA was vigorous PA</p> <p>Control: Regular PE/PA curriculum (135 min/week)</p>		-	<p><u>Numeracy</u> intervention = control</p> <p><u>Reading</u> intervention = control</p> <p><u>English</u> intervention = control</p>	0/3
<p>Schmidt et al., 2015</p> <p>Intervention: (1) cognitively engaging team games intervention; 2 days/week; MVPA (2) aerobic exercise; 2 days/week; MVPA</p> <p>Control: Regular PE (2/week)</p>	<p><u>Updating:</u> intervention (1) = control/intervention (2)</p> <p><u>Inhibition:</u> intervention (1) = control/intervention (2)</p> <p><u>Shifting:</u> intervention (1) > control/intervention (2)</p>	1/3	Not applicable	-
<p>Subramanian et al., 2016</p>	<p><u>Two target letter cancellation (1 construct, 3 aspects)</u> LCT omissions: intervention = control LCT commission: intervention = control</p>	3/3	Not applicable	-

<p>Intervention: Structured recess (aerobic activities); 120 min; 6 days/week</p> <p>Control: Unstructured recess; 120 min; 6 days/week</p>	<p>LCT time: intervention > control</p> <p><u>Trail making (1 construct, 2 versions)</u> TTA: intervention = control TTB: intervention > control</p> <p><u>Ruff Figure fluency (1 construct, 3 aspects)</u> Designs: intervention > control Rotations: intervention > control Preservations: intervention > control</p>			
<p>Telford et al., 2012</p> <p>Intervention: 2 days/week specialist-taught PE (each 45-50 min) plus 1 day/week classroom teacher-taught PE (50-60 min)</p> <p>Control: 150 min/week classroom teacher taught PE</p>	<p>Not applicable</p>	<p>-</p>	<p><u>Literacy</u> intervention = control</p> <p><u>Numeracy</u> intervention > control</p>	<p>1/2</p>
	<p>Total cognitive performance</p>	<p>10/21</p>	<p>Total academic performance</p>	<p>15/25</p>

*number of analyses with beneficial significant interventions effects/total number of analyses [name of test/construct: underlined; significant beneficial effects in **bold**]

** number of constructs/test with at least 1 beneficial significant intervention effect/number of constructs measured [name of test/construct: underlined or **underlined and bold** in case at least 1 of the subtests/aspects showed beneficial significant effects; significant beneficial constructs with at least 1 beneficial significant in **bold**]