

Supplemental Digital Content 4 Trait correlations (r_{trait}) as well as the correlations between additive genetic (r_A), shared environmental (r_C) and unique environmental (r_E) factors for leisure-time physical activity (LTPA) and academic performance (AP) with 95% confidence intervals (CI) for the full and best-fitting models at ages 12, 14, 17 and 24 in both sexes.

					<u>Trait correlation</u>	<u>Additive genetic correlation</u>		<u>Shared environmental factors</u>		<u>Unique environmental factors</u>	
Trait 1	Trait 2	Model	Δdf	p -value	r_{trait} (95% CI)	r_A (95% CI)	% Explained of r_{trait}	r_C (95% CI)	% Explained of r_{trait}	r_E (95% CI)	% Explained of r_{trait}
<u>Males</u>											
LTPA age 12	AP age 12	Full model	-	-	0.08 (0.03 to 0.13)	0.22 (-0.20 to 0.52)	*	-0.10 (-0.61 to 0.78)	*	0.01 (-0.10 to 0.13)	*
		Best fitting model	2	0.92	0.09 (0.04 to 0.13)	0.17 (0.08 to 0.28)	100%	-	-	-	-
LTPA age 12	AP age 14	Full model	-	-	0.08 (0.02 to 0.12)	-0.07 (-0.38 to 0.21)	*	0.33 (0.03 to 0.62)	*	0.01 (-0.11 to 0.13)	*
		Best fitting model	1	0.86	0.08 (0.02 to 0.13)	-0.06 (-0.31 to 0.18)	*	0.32 (0.03 to 0.61)	*	-	-
LTPA age 12	AP age 17	Full model	-	-	0.07 (0.02 to 0.11)	-0.11 (-0.42 to 0.16)	*	0.38 (0.13 to 0.61)	*	-0.07 (-0.18 to 0.05)	*
		Best fitting model	1	0.42	0.07 (0.02 to 0.12)	-	-	0.30 (0.14 to 0.47)	*	-0.09 (-0.19 to 0.004)	*
LTPA age 12	AP age 24	Full model	-	-	0.11 (0.05 to 0.16)	0.08 (-0.21 to 0.35)	*	0.30 (0.01 to 0.58)	*	-0.02 (-0.14 to 0.11)	*
		Best fitting model	2	0.82	0.10 (0.05 to 0.15)	-	-	0.37 (0.19 to 0.56)	100%	-	-
LTPA age 14	AP age 12	Full model	-	-	0.12 (0.08 to 0.17)	0.16 (-0.09 to 0.44)	64%	0.22 (-1.00 to 1.00)	35%	0.005 (-0.10 to 0.11)	1%
		Best fitting model	1	0.93	0.12 (0.08 to 0.17)	0.16 (-0.06 to 0.41)	66%	0.21 (-1.00 to 1.00)	34%	-	-
LTPA age 14	AP age 14	Full model	-	-	0.13 (0.07 to 0.18)	0.23 (-0.21 to 0.80)	*	0.09 (0.00 to 1.00)	*	-0.009 (-0.15 to 0.13)	*
		Best fitting model	1	0.97	0.13 (0.07 to 0.18)	0.15 (-0.09 to 0.42)	47%	0.25 (-0.12 to 1.00)	53%	-	-
LTPA age 14	AP age 17	Full model	-	-	0.10 (0.05 to 0.15)	0.10 (-0.20 to 0.36)	*	0.27 (-0.05 to 1.00)	*	-0.03 (-0.14 to 0.08)	*
		Best fitting model	2	0.72	0.10 (0.05 to 0.14)	-	-	0.36 (0.17 to 1.00)	100%	-	-
LTPA age 14	AP age 24	Full model	-	-	0.07 (0.01 to 0.13)	0.02 (-0.30 to 0.52)	9%	0.15 (-0.52 to 0.59)	47%	0.09 (-0.04 to 0.09)	44%
		Best fitting model	1	0.91	0.07 (0.02 to 0.13)	-	-	0.17 (-0.08 to 0.48)	53%	0.10 (-0.01 to 0.20)	47%
LTPA age 17	AP age 12	Full model	-	-	0.14 (0.09 to 0.19)	-0.05 (-0.26 to 0.14)	*	0.60 (0.28 to 1.00)	*	0.04 (-0.08 to 0.17)	*
		Best fitting model	2	0.78	0.14 (0.09 to 0.19)	-	-	0.56 (0.32 to 1.00)	100%	-	-

LTPA age 17	AP age 14	Full model	-	-	0.20 (0.14 to 0.26)	0.09 (-0.20 to 0.35)	18%	0.56 (0.22 to 1.00)	76%	0.04 (-0.10 to 0.19)	6%
		Best fitting model	1	0.56	0.20 (0.14 to 0.26)	0.13 (-0.10 to 0.35)	27%	0.54 (0.21 to 1.00)	73%	-	-
LTPA age 17	AP age 17	Full model	-	-	0.22 (0.17 to 0.26)	0.19 (-0.04 to 0.39)	37%	0.50 (0.20 to 1.00)	59%	0.03 (-0.08 to 0.14)	4%
		Best fitting model	1	0.58	0.22 (0.17 to 0.26)	0.22 (0.03 to 0.39)	43%	0.48 (0.19 to 1.00)	57%	-	-
LTPA age 17	AP age 24	Full model	-	-	0.21 (0.15 to 0.27)	0.22 (-0.04 to 0.48)	45%	0.40 (0.06 to 1.00)	45%	0.07 (-0.07 to 0.20)	10%
		Best fitting model	1	0.32	0.21 (0.15 to 0.27)	0.29 (0.07 to 0.51)	59%	0.36 (0.03 to 1.00)	41%	-	-
LTPA age 24	AP age 12	Full model	-	-	0.13 (0.07 to 0.19)	-0.08 (-0.39 to 0.19)	*	1.00 (0.40 to 1.00)	*	0.06 (-0.09 to 0.21)	*
		Best fitting model	2	1.00	0.14 (0.08 to 0.19)	0.25 (0.15 to 0.36)	100%	-	-	-	-
LTPA age 24	AP age 14	Full model	-	-	0.17 (-0.10 to 0.24)	0.27 (-0.05 to 0.84)	66%	1.00 (-1.00 to 1.00)	30%	0.02 (-0.16 to 0.20)	4%
		Best fitting model	2	0.72	0.16 (0.09 to 0.23)	0.39 (0.21 to 0.66)	100%	-	-	-	-
LTPA age 24	AP age 17	Full model	-	-	0.17 (-0.10 to 0.24)	0.26 (-0.06 to 0.61)	*	1.00 (-1.00 to 1.00)	*	-0.03 (-0.17 to 0.12)	*
		Best fitting model	2	0.20	0.18 (0.12 to 0.24)	0.43 (0.28 to 0.63)	100%	-	-	-	-
LTPA age 24	AP age 24	Full model	-	-	0.17 (0.11 to 0.22)	0.21 (-0.09 to 0.50)	58%	1.00 (-1.00 to 1.00)	26%	0.07 (-0.06 to 0.21)	16%
		Best fitting model	2	0.45	0.10 (0.05 to 0.15)	0.34 (0.20 to 0.54)	100%	-	-	-	-
Females											
LTPA age 12	AP age 12	Full model	-	-	0.09 (0.04 to 0.14)	0.01 (-0.41 to 0.27)	5%	0.25 (0.04 to 0.85)	67%	0.10 (0.00 to 0.20)	28%
		Best fitting model	1	0.93	0.09 (0.05 to 0.14)	-	-	0.26 (0.09 to 0.56)	72%	0.10 (0.01 to 0.19)	28%
LTPA age 12	AP age 14	Full model	-	-	0.07 (0.01 to 0.13)	0.01 (-0.35 to 0.35)	6%	0.07 (-0.12 to 0.26)	47%	0.14 (0.02 to 0.26)	47%
		Best fitting model	1	0.93	0.07 (0.01 to 0.13)	-	-	0.08 (-0.04 to 0.20)	51%	0.15 (0.04 to 0.25)	49%
LTPA age 12	AP age 17	Full model	-	-	0.08 (0.02 to 0.12)	0.20 (-0.01 to 0.49)	*	0.11 (-0.03 to 0.25)	*	-0.03 (-0.13 to 0.07)	*
		Best fitting model	1	0.53	0.09 (0.05 to 0.14)	0.16 (-0.01 to 0.40)	56%	0.11 (-0.02 to 0.25)	44%	-	-
LTPA age 12	AP age 24	Full model	-	-	0.11 (0.06 to 0.16)	0.01 (-0.38 to 0.33)	1%	0.18 (0.00 to 0.38)	68%	0.12 (0.01 to 0.23)	30%
		Best fitting model	1	0.97	0.11 (0.06 to 0.16)	-	-	0.19 (0.06 to 0.32)	69%	0.12 (0.02 to 0.22)	31%
LTPA age 14	AP age 12	Full model	-	-	0.09 (0.04 to 0.14)	0.11 (-0.11 to 0.32)	58%	0.10 (-0.27 to 0.48)	21%	0.06 (-0.04 to 0.17)	21%
		Best fitting model	1	0.56	0.09 (0.04 to 0.14)	0.15 (0.03 to 0.31)	82%	-	-	0.05 (-0.05 to 0.16)	18%

LTPA age 14	AP age 14	Full model	-	-	0.12 (0.06 to 0.18)	-0.41 (-0.84 to 0.16)	*	0.98 (0.17 to 1.00)	*	0.12 (0.00 to 0.24)	*
		Best fitting model	2	0.25	0.12 (0.07 to 0.17)	-	-	0.36 (0.20 to 0.66)	100%	-	-
LTPA age 14	AP age 17	Full model	-	-	0.11 (0.07 to 0.16)	0.15 (-0.04 to 0.36)	51%	0.21 (0.00 to 0.47)	49%	0.00 (-0.10 to 0.10)	0%
		Best fitting model	1	0.98	0.11 (0.07 to 0.16)	0.15 (-0.01 to 0.33)	51%	0.21 (0.00 to 0.47)	49%	-	-
LTPA age 14	AP age 24	Full model	-	-	0.08 (0.03 to 0.13)	0.07 (-0.25 to 0.75)	31%	0.17 (-0.57 to 0.55)	62%	0.02 (-0.12 to 0.13)	6%
		Best fitting model	1	0.80	0.08 (0.02 to 0.13)	0.09 (-0.17 to 0.67)	42%	0.16 (-0.54 to 0.53)	58%	-	-
LTPA age 17	AP age 12	Full model	-	-	0.09 (0.04 to 0.14)	0.16 (-0.03 to 0.37)	*	0.18 (-0.11 to 1.00)	*	-0.07 (-0.18 to 0.04)	*
		Best fitting model	2	0.23	0.08 (0.03 to 0.12)	-	-	0.33 (0.12 to 1.00)	100%	-	-
LTPA age 17	AP age 14	Full model	-	-	0.11 (0.05 to 0.17)	0.07 (-0.22 to 0.31)	26%	0.28 (-0.09 to 1.00)	64%	0.04 (-0.09 to 0.16)	10%
		Best fitting model	1	0.59	0.10 (0.05 to 0.16)	-	-	0.35 (0.12 to 1.00)	86%	0.05 (-0.05 to 0.16)	14%
LTPA age 17	AP age 17	Full model	-	-	0.12 (0.07 to 0.16)	0.03 (-0.18 to 0.20)	10%	0.48 (0.20 to 1.00)	87%	0.01 (-0.08 to 0.11)	3%
		Best fitting model	2	0.88	0.11 (0.07 to 0.15)	-	-	0.51 (0.29 to 1.00)	100%	-	-
LTPA age 17	AP age 24	Full model	-	-	0.18 (0.13 to 0.24)	-0.04 (-0.37 to 0.21)	*	0.64 (0.26 to 1.00)	*	0.15 (0.04 to 0.26)	*
		Best fitting model	1	0.76	0.19 (0.13 to 0.24)	-	-	0.60 (0.32 to 1.00)	75%	0.14 (0.04 to 1.00)	25%
LTPA age 24	AP age 12	Full model	-	-	0.04 (-0.02 to 0.09)	0.30 (0.04 to 0.71)	*	-1.00 (-1.00 to 1.00)	*	-0.06 (-0.18 to 0.07)	*
		Best fitting model	2	0.24	0.05 (-0.01 to 0.10)	0.10 (-0.02 to 0.27)	100%	-	-	-	-
LTPA age 24	AP age 14	Full model	-	-	0.05 (-0.01 to 0.12)	0.00 (-0.04 to 0.32)	*	0.42 (-1.00 to 1.00)	*	-0.03 (-0.17 to 0.11)	*
		Best fitting model	1	0.99	0.05 (-0.01 to 0.11)	-	-	0.42 (0.03 to 1.00)	*	-0.03 (-0.15 to 0.09)	*
LTPA age 24	AP age 17	Full model	-	-	0.08 (0.03 to 0.13)	-0.04 (-0.30 to 0.18)	*	0.67 (0.10 to 1.00)	*	0.05 (-0.07 to 0.16)	*
		Best fitting model	2	0.73	0.07 (0.03 to 0.12)	-	-	0.69 (0.18 to 1.00)	100%	-	-
LTPA age 24	AP age 24	Full model	-	-	0.10 (0.05 to 0.15)	0.12 (-0.21 to 0.70)	45%	0.29 (-1.00 to 1.00)	39%	0.04 (-0.07 to 0.15)	17%
		Best fitting model	2	0.66	0.10 (0.05 to 0.15)	0.25 (0.11 to 0.53)	100%	-	-	-	-

*=cannot be calculated