

Additional file 1

Table S1. Standardized coefficients from sensitivity analyses of the ‘jump’ item.

	Intensity	Contains ME			
Jump		PA→FMS		FMS→PA	
	TPA	0.181 (<0.001)		0.164 (0.001)	
	MVPA	0.177 (<0.001)		0.140 (0.003)	
	VPA	0.178 (<0.001)		0.154 (0.002)	
	MPA	0.154 (<0.001)		0.090 (0.043)	
	LPA	0.071 (0.108)		0.063 (0.166)	
	SED	-0.130 (0.002)		-0.118 (0.011)	
		Corrected for ME (item and PA)			
	TPA	0.294 (0.005)		0.363 (0.049)	
	MVPA	0.257 (0.003)		0.290 (0.045)	
	VPA	0.240 (0.011)		0.315 (0.063)	
	MPA	0.248 (0.005)		0.184 (0.124)	
	LPA	0.126 (0.141)		0.136 (0.167)	
	SED	-0.194 (0.022)		-0.255 (0.024)	

Estimate (p-value) for paths PA-FMS; FMS-PA. ME=Measurement error, TPA=total physical activity, MVPA=Moderate-to-vigorous physical activity, VPA=Vigorous physical activity, MPA=Moderate physical activity, LPA=Light physical activity, SED=Sedentary behavior. Models adjusted for sex, age, BMI, parents’ education level, FMS test person, and group. Significant associations are marked in bold.

Additional file 2

Table S2. Standardized coefficients for paths between physical activity and fundamental motor skills, and goodness of fit indices for the longitudinal models not corrected for measurement error.

	Intensity	Contains PA ME		Model fit			
		PA→FMS, est (p)	FMS→PA, est (p)	Chi-square (df)	CFI	RMSEA (90% CI)	SRMR
Locomotor skills							
	TPA	0.229 (<0.001)	0.322 (<0.001)	76.916 (39)	0.965	0.034 (0.022-0.045)	0.028
	MVPA	0.249 (<0.001)	0.281 (<0.001)	76.088 (39)	0.968	0.034 (0.022-0.045)	0.029
	VPA	0.210 (<0.001)	0.319 (<0.001)	77.808 (39)	0.966	0.035 (0.023-0.046)	0.028
	MPA	0.264 (<0.001)	0.176 (0.022)	73.104 (39)	0.970	0.033 (0.021-0.044)	0.029
	LPA	0.155 (0.018)	0.078 (0.239)	71.448 (39)	0.969	0.032 (0.020-0.043)	0.027
	SED	-0.212 (0.001)	-0.200 (0.005)	73.143 (39)	0.968	0.033 (0.021-0.044)	0.028
Object control skills							
	TPA	0.156 (0.036)	0.080 (0.487)	106.267 (41)	0.907	0.044 (0.034-0.054)	0.033
	MVPA	0.197 (0.004)	0.086 (0.485)	107.536 (41)	0.916	0.044 (0.034-0.055)	0.034
	VPA	0.151 (0.032)	0.040 (0.722)	106.023 (41)	0.916	0.044 (0.034-0.054)	0.033
	MPA	0.229 (0.001)	0.143 (0.241)	109.208 (41)	0.916	0.045 (0.035-0.055)	0.034
	LPA	0.103 (0.066)	0.137 (0.178)	105.910 (41)	0.918	0.044 (0.034-0.054)	0.034
	SED	-0.157 (0.007)	-0.142 (0.219)	107.410 (41)	0.913	0.044 (0.034-0.055)	0.034
Balance skills							
	TPA	0.077 (0.122)	0.028 (0.768)	43.067 (41)	0.998	0.008 (0.000-0.026)	0.017
	MVPA	0.114 (0.010)	0.083 (0.359)	39.779 (41)	1	0.000 (0.000-0.023)	0.017
	VPA	0.084 (0.077)	0.039 (0.655)	41.500 (41)	1	0.004 (0.000-0.024)	0.017
	MPA	0.140 (0.001)	0.139 (0.133)	37.902 (41)	1	0.000 (0.000-0.021)	0.017
	LPA	0.027 (0.602)	0.069 (0.335)	38.192 (41)	1	0.000 (0.000-0.021)	0.017
	SED	-0.072 (0.138)	-0.089 (0.281)	38.542 (41)	1	0.000 (0.000-0.022)	0.017

Estimate (p-value) for paths PA-FMS; FMS-PA. ME=Measurement error, TPA=total physical activity, MVPA=Moderate-to-vigorous physical activity, VPA=Vigorous physical activity, MPA=Moderate physical activity, LPA=Light physical activity, SED=Sedentary behavior. CFI=Comparative Fit Index, RMSEA=Root Mean Square Error of Approximation, SRMR=Standardized Root Mean Squared Residual. Models are adjusted for sex, age, BMI, parents' education level, FMS assessor, and group allocation. Significant associations are marked in bold. N=820.

Additional file 3

Table S3. Standardized coefficients for paths between physical activity and fitness measures from longitudinal models not corrected for measurement error, using observed fitness-scores (saturated model, i.e., no model fit indices).

	Intensity	Contains PA ME	
		PA→FIT, est (p)	FIT→PA, est (p)
Handgrip strength			
	TPA	0.141 (0.008)	0.096 (0.065)
	MVPA	0.137 (0.012)	0.078 (0.126)
	VPA	0.139 (0.007)	0.116 (0.013)
	MPA	0.114 (0.032)	0.012 (0.823)
	LPA	0.065 (0.119)	-0.069 (0.278)
	SED	-0.106 (0.033)	0.001 (0.989)
Standing long jump			
	TPA	0.179 (<0.001)	0.164 (<0.001)
	MVPA	0.173 (<0.001)	0.114 (0.012)
	VPA	0.189 (<0.001)	0.174 (<0.001)
	MPA	0.126 (<0.001)	0.009 (0.828)
	LPA	0.016 (0.629)	-0.051 (0.213)
	SED	-0.089 (0.003)	-0.032 (0.450)
Motor fitness			
	TPA	-0.144 (<0.001)	-0.245 (<0.001)
	MVPA	-0.150 (<0.001)	-0.187 (0.005)
	VPA	-0.128 (<0.001)	-0.256 (<0.001)
	MPA	-0.158 (<0.001)	-0.039 (0.585)
	LPA	-0.097 (0.007)	-0.014 (0.815)
	SED	0.132 (<0.001)	0.114 (0.077)

Estimate (p-value) for paths PA-FIT; FIT-PA. ME=Measurement error, TPA=total physical activity, MVPA=Moderate-to-vigorous physical activity, VPA=Vigorous physical activity, MPA=Moderate physical activity, LPA=Light physical activity, SED=Sedentary behavior. Models adjusted for sex, age, BMI, parents' education level, FMS assessor, and group allocation. Significant associations are marked in bold. N=820. Lower motor fitness estimates indicate better performance.

Additional file 4

Table S4. Standardized coefficients for paths between physical activity and fundamental motor skills, and goodness of fit indices for the longitudinal models in control group.

	Intensity				Model fit			
		PA→FMS, est (p)	FMS→PA, est (p)		Chi-square (df)	CFI	RMSEA (90% CI)	SRMR
Locomotor skills								
	TPA	0.334 (0.003)	0.338 (0.053)		45.474 (35)	0.984	0.026 (0.000-0.046)	0.031
	MVPA	0.358 (0.001)	0.331 (0.087)		45.379 (35)	0.986	0.026 (0.000-0.046)	0.032
	VPA	0.317 (0.003)	0.265 (0.191)		46.014 (35)	0.984	0.027 (0.000-0.046)	0.031
	MPA	0.359 (0.001)	0.311 (0.070)		47.757 (35)	0.982	0.029 (0.000-0.048)	0.033
	LPA	0.177 (0.097)	0.249 (0.038)		45.422 (35)	0.984	0.026 (0.000-0.046)	0.032
	SED	-0.264 (0.015)	-0.371 (0.008)		44.298 (35)	0.986	0.025 (0.000-0.025)	0.032
Object control skills								
	TPA	0.296 (0.020)	-0.392 (0.229)		102.394 (37)	0.862	0.064 (0.049-0.078)	0.045
	MVPA	0.328 (0.002)	-0.161 (0.621)		103.472 (37)	0.877	0.064 (0.050-0.079)	0.046
	VPA	0.288 (0.009)	-0.297 (0.327)		104.401 (37)	0.871	0.065 (0.050-0.079)	0.045
	MPA	0.343 (0.002)	0.059 (0.842)		102.484 (37)	0.878	0.064 (0.049-0.078)	0.047
	LPA	0.170 (0.082)	0.003 (0.983)		101.516 (37)	0.884	0.063 (0.049-0.078)	0.049
	SED	-0.264 (0.011)	0.037 (0.876)		100.059 (37)	0.883	0.062 (0.048-0.077)	0.047
Balance skills								
	TPA	0.120 (0.243)	-0.132 (0.429)		42.673 (37)	0.993	0.019 (0.000-0.040)	0.023
	MVPA	0.154 (0.050)	0.112 (0.462)		41.029 (37)	0.995	0.016 (0.000-0.038)	0.023
	VPA	0.139 (0.122)	0.034 (0.799)		42.228 (37)	0.994	0.018 (0.000-0.040)	0.023
	MPA	0.152 (0.039)	0.199 (0.280)		37.949 (37)	0.999	0.008 (0.000-0.035)	0.022
	LPA	-0.015 (0.872)	0.008 (0.939)		39.949 (37)	0.997	0.014 (0.000-0.037)	0.023
	SED	-0.064 (0.461)	-0.074 (0.542)		40.553 (37)	0.996	0.015 (0.000-0.038)	0.023

Estimate (p-value) for paths PA-FMS; FMS-PA. TPA=total physical activity, MVPA=Moderate-to-vigorous physical activity, VPA=Vigorous physical activity, MPA=Moderate physical activity, LPA=Light physical activity, SED=Sedentary behavior. CFI=Comparative Fit Index, RMSEA=Root Mean Square Error of Approximation, SRMR=Standardized Root Mean Squared Residual. Models are adjusted for sex, age, BMI, parents' education level, FMS assessor, and group allocation. Significant associations are marked in bold. N=437.

Additional file 5

Table S5. Standardized coefficients for paths between physical activity and fitness measures from longitudinal models in control group, using observed fitness-scores (saturated model, i.e., no model fit indices).

	Intensity	PA→FIT, est (p)	FIT→PA, est (p)
Handgrip strength			
	TPA	0.114 (0.324)	0.150 (0.310)
	MVPA	0.084 (0.420)	0.074 (0.479)
	VPA	0.097 (0.342)	0.160 (0.142)
	MPA	0.054 (0.575)	-0.040 (0.600)
	LPA	0.030 (0.696)	-0.102 (0.173)
	SED	-0.059 (0.525)	0.033 (0.706)
Standing long jump			
	TPA	0.267 (<0.001)	0.045 (0.735)
	MVPA	0.233 (<0.001)	-0.032 (0.715)
	VPA	0.253 (<0.001)	0.066 (0.543)
	MPA	0.174 (<0.001)	-0.135 (0.025)
	LPA	0.077 (0.112)	-0.074 (0.306)
	SED	-0.151 (<0.001)	0.037 (0.577)
Motor fitness			
	TPA	-0.229 (<0.001)	-0.242 (0.103)
	MVPA	-0.225 (<0.001)	-0.151 (0.214)
	VPA	-0.204 (<0.001)	-0.260 (0.023)
	MPA	-0.216 (<0.001)	0.050 (0.682)
	LPA	-0.115 (0.006)	-0.014 (0.876)
	SED	0.176 (<0.001)	0.108 (0.305)

Estimate (p-value) for paths PA-FIT; FIT-PA. TPA=total physical activity, MVPA=Moderate-to-vigorous physical activity, VPA=Vigorous physical activity, MPA=Moderate physical activity, LPA=Light physical activity, SED=Sedentary behavior. Models adjusted for sex, age, BMI, parents' education level, FMS assessor, and group allocation. Significant associations are marked in bold. N=437. Lower motor fitness estimates indicate better performance.