

Supplementary Table 1. Results of multilevel regression models of daily physical activity and sedentary time by rainfall category.

	MVPA			VPA			Sedentary time			counts per minute		
	$\beta$	S.E.	p	$\beta$	S.E.	p	$\beta$	S.E.	p	$\beta$	S.E.	p
Age (years)	2.387	3.41	<i>0.484</i>	0.467	1.952	<i>0.811</i>	2.761	5.725	<i>0.629</i>	-12.697	32.082	<i>0.692</i>
Sex (female)	-12.915	1.988	<b>&lt;0.001</b>	-8.631	1.18	<b>&lt;0.001</b>	18.997	3.452	<b>&lt;0.001</b>	-87.404	19.524	<b>&lt;0.001</b>
Weekend day	3.262	0.956	<b>0.001</b>	1.245	0.521	0.017	-17.529	1.561	<b>&lt;0.001</b>	56.194	8.753	<b>&lt;0.001</b>
Registered time (minutes)	0.115	0.006	<b>&lt;0.001</b>	0.041	0.003	<b>&lt;0.001</b>	0.615	0.009	<b>&lt;0.001</b>			
Daytime temperature (°C)	0.147	0.145	<i>0.313</i>	-0.143	0.079	<i>0.070</i>	-0.708	0.234	<b>0.003</b>	1.892	1.397	<i>0.176</i>
Study Phase												
SPEEDY 2 (2008)	-7.868	3.678	0.032	-3.807	2.083	<i>0.068</i>	9.53	6.125	<i>0.120</i>	-67.882	34.706	<i>0.050</i>
SPEEDY 3 (2011)	-24.877	13.97	<i>0.075</i>	-9.93	7.994	<i>0.214</i>	44.966	23.421	<i>0.055</i>	-167.54	131.278	<i>0.202</i>
Rainfall tertile												
T2: >0 - <1.7mm	-7.955	1.883	<b>&lt;0.001</b>	-3.269	1.022	<b>0.001</b>	14.875	3.055	<b>&lt;0.001</b>	-63.413	18.009	<b>&lt;0.001</b>
T3: $\geq$ 1.7mm	-14.008	1.872	<b>&lt;0.001</b>	-7.056	1.018	<b>&lt;0.001</b>	22.81	3.04	<b>&lt;0.001</b>	-134.434	18.064	<b>&lt;0.001</b>
Interactions												
Rainfall T2 # SPEEDY 2	2.43	2.538	<i>0.338</i>	0.77	1.373	<i>0.575</i>	-5.373	4.103	<i>0.190</i>	9.817	24.047	<i>0.683</i>
Rainfall T3 # SPEEDY 2	2.576	2.62	<i>0.325</i>	1.857	1.437	<i>0.196</i>	-2.94	4.293	<i>0.493</i>	32.365	25.789	<i>0.209</i>
Rainfall T2 # SPEEDY 3	12.691	2.744	<b>&lt;0.001</b>	6.298	1.488	<b>&lt;0.001</b>	-19.079	4.419	<b>&lt;0.001</b>	108.104	26.299	<b>&lt;0.001</b>
Rainfall T3 # SPEEDY 3	8.139	2.608	<b>0.002</b>	3.904	1.407	<b>0.006</b>	-16.674	4.196	0.016	91.154	24.844	<b>&lt;0.001</b>
Variance Partition Coefficients												
School	11.6%		<b>0.008</b>	17.1%		<b>0.008</b>	11.1%		<b>0.008</b>	14.5%		<b>0.008</b>
Participant	19.4%		<b>&lt;0.001</b>	19.8%		<b>&lt;0.001</b>	21.3%		<b>&lt;0.001</b>	18.0%		<b>&lt;0.001</b>
Day	69.1%		<b>&lt;0.001</b>	63.1%		<b>&lt;0.001</b>	67.6%		<b>&lt;0.001</b>	67.5%		<b>&lt;0.001</b>

Reference categories for categorical variables: Sex = male, Weekend day = week day, Study phase = SPEEDY 1 (2007), Rainfall tertile = Tertile 1 (0mm rain).

Variance Partition Coefficients describe the percentage of residual variance remaining at each level of the model hierarchy.

For p values, **bold font** indicates statistical significance  $p < 0.01$ , regular font indicates statistical significance  $p < 0.05$ , and *italic font* indicates statistical non-significance ( $p \geq 0.05$ )