

## WEB MATERIAL

### Reproducibility, Validity, and Relative Validity of Self-Report Methods for Assessing Physical Activity in Epidemiologic Studies: Findings From the Women's Lifestyle Validation Study

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## **Web Appendix**

### **Methods:**

#### ***Study Population:***

The Women's Lifestyle Validation Study is one of the three components of the Multi-Cohort Eating and Activity Study for Understanding Reporting Error (MEASURE)(16), which was conducted to investigate the measurement error associated with self-reported physical activity and dietary assessments. The study was conducted within the NHS and NHSII between 2010 and 2012. The NHS cohort was initiated in 1976 when 121,701 US registered female nurses, aged 30-55 years were recruited. The NHS-II cohort was initiated in 1989 when 116,429 US female nurses, aged 25-42 years were enrolled. Participants in both cohorts have completed mailed questionnaires every two years about their medical history and lifestyle factors. Invited participants were a random sample of NHS and NHSII participants who had no history of coronary heart disease, stroke, cancer, or major neurological disease, completed the 2006/7 food frequency questionnaire, had previously provided blood samples, had access to broadband internet, and were not planning to make any substantial changes in their diet or physical activity. A total of 5,503 women were invited to participate; 851 consented to participate, and 796 women were enrolled due to budgetary constraints (Web Figure 1). This study was approved by the human subject committees of the Harvard T.H. Chan School of Public Health and Brigham and Women's Hospital.

#### ***Physical Activity Assessments:***

To represent the one-year time frame of the PA questionnaire, data were collected over approximately 15 months with the order of measurements varied (Figure 1). This included two self-administered PAQs, four ACT24s, one DLW measurement (repeated among 90 women), two one-week accelerometer measurements, and four RPR measurements. To avoid artificial high correlations between the different assessment methods, a two-

week spacing was implemented between the PAQ and ACT24, accelerometer and ACT24, and PAQ and accelerometer. The DLW measurement and one of the accelerometer measurements were designed to occur during the same phase (three-month period) of the study, but not during the same week in order to avoid artificial high correlations.

### **Physical activity questionnaire (PAQ)**

In addition to type of activities, participants reported their walking pace: easy (< 2 miles/hour), normal (2 – 2.9 miles/hour), brisk (3 – 3.9 miles/hour), or very brisk/striding ( $\geq$  4 miles/hour), and number of flights climbed daily (no flights, 1-2, 3-4, 5-9, 10-14,  $\geq$  15 flights). Data on sedentary behaviors were also collected and included sitting at work or commuting, sitting at home while watching TV/VCR/DVD, and other sitting at home (e.g. desk, eating, computer).

Activities were grouped by intensity as follows: vigorous PA ( $\geq$ 6 MET: jogging, running, high-intensity bicycling, lap swimming, and tennis, squash/racquetball, stairs), moderate PA (3-5.9 MET: walking  $\geq$ 2 mph, low- to moderate-intensity bicycling, lap swimming, and tennis, other aerobic exercise, moderate/heavy outdoor work, weightlifting), and moderate to vigorous intensity PA (MVPA;  $\geq$ 3 MET). Total activity included light (<3 MET) and MVPA.

### **Activities Completed Over Time in 24 hours (ACT24)**

For overlapping activities, the tool allowed participants to indicate their primary activity during that period. Data on posture and level of energy expenditure were collected and behaviors were categorized as active (standing upright or activity requiring a high level of energy expenditure  $\geq$  2 MET) or sedentary (sitting, reclining, or lying down activity requiring a low level of energy expenditure < 2 MET). An energy expenditure score (MET-hours/week) was computed based on the MET score associated with each activity which was derived from the 2011 Compendium of Physical Activity (18) multiplied by the time spent on each activity.

### **Accelerometer**

Participants were instructed to wear the monitor on the hip for seven days during all waking hours, except when bathing or swimming, and record the days the monitor was worn. Epoch length of 1 second was set, and we used data based on the triaxial vector magnitude. Data on total activity counts (TAC) per day were used to determine the total volume of physical activity. Intensity was defined according to the following thresholds: <200 counts/minute for sedentary behavior, 200-2689 counts/minute for light intensity, 2690-6166 counts/minute for moderate intensity, and  $\geq 6167$  counts/minute for vigorous intensity. Time spent in each intensity category was summed up for every minute per day. For sedentary behavior, time spent in  $\geq 15$ -minute bouts was also examined.

Non-wear time was defined as 60 minutes or more with consecutive zero accelerometer counts, allowing up to two minutes with limited movement (< 200 counts per minute, the threshold for sedentary time using triaxial counts) (1, 2). Mean daily time in intensity-specific categories was calculated across all valid wear days, then divided by 60 to get the number of hours per day. To predict METs from triaxial counts, we used the equation  $\text{METs} = 0.000863 * (\text{activity counts from all 3 axes}) + 0.668876$ . For each minute of non-wear time or when triaxial counts were < 100 per minute, a value of 1 MET was assigned. The computed METs were summed over all minutes to get total energy expenditure in MET-min/day, which was then divided by 60 to compute MET-hours/day. Two 1-week accelerometer measurements were taken for each participant which were spaced at least 6 months apart.

### ***Statistical Analyses***

Deattenuated correlation coefficients and their 95% CIs were computed to account for within-person variation and number of repeated measurements of the reference method using the formula:  $r_c = r_o \sqrt{1 + \lambda/k}$  where  $r_c$  is the deattenuated correlation coefficient,  $r_o$  represents the observed correlation coefficient,  $\lambda$  is the ratio of within- to between-person variation, and  $k$  is the number of replicates of the reference method.

### **Method of Triads:**

The method of triads was used to estimate the correlation of each assessment method with the latent true physical activity level. In the method of triads, we assumed that the random errors of the physical activity assessment methods were uncorrelated because these methods were administered in random order and not close in time to avoid spuriously high correlations, and the different assessment methods rely on different sources of information. We also assumed that positive linear correlations existed between the assessment methods and the true physical activity levels (3). In this method, we checked for Heywood cases which usually occur when the estimated validity coefficients are  $>1$  or inestimable (4).

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**Web Table 1: Baseline distributions (median, 25<sup>th</sup> -75<sup>th</sup> percentiles) of the different physical activity measurements in the Women's Lifestyle Validation Study (N=683), stratified by BMI, age, and cohort, United States, 2010-2012.**

	Overall (N=683)	BMI		Age		Cohort	
		< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
Physical Activity Questionnaire							
Total activity, MET-hr/day <sup>a</sup>	7.4 (5.1-10.5)	8.4 (6.0-10.9)	6.7 (4.1- 9.7)	8.2 (5.6-11.3)	6.8 (4.5-9.9)	6.7 (4.4-9.8)	8.1 (5.6-11.3)
MVPA, MET-hr/day	3.2 (1.4-6.0)	3.9 (2.0-6.7)	2.4 (1.0- 5.2)	3.4 (1.5-6.2)	2.9 (1.4-5.9)	2.9 (1.4-5.9)	3.4 (1.5-6.1)
Sedentary, hr/day	3.2 (2.1-3.9)	3.2 (2.1-3.8)	3.4 (2.1- 3.9)	3.4 (2.3-4.2)	3 (2.1-3.7)	3 (2.1-3.6)	3.6 (2.3-4.2)
Activities Completed Over Time in 24 Hours							
Total activity, MET-hr/day	14.5 (9.8-20.9)	15.9 (10.6-22.2)	13.6 (9.4-19.2)	16.1 (10.5-22.5)	13.1 (9.5-19)	13.3 (10.0-19.1)	15.5 (9.6-22.2)
MVPA, MET-hr/day	3.7 (0.6-9.0)	4.6 (1.5-10.3)	3.2 (0.0-8.2)	4.3 (0.9-12.0)	3.2 (0.1-6.7)	3.3 (0.3-7.6)	4.2 (0.6-10.5)
Sedentary, hr/day	7.0 (2.2-9.3)	6.6 (4.8-8.8)	7.3 (5.1-9.9)	6.7 (4.6-9.5)	7.3 (5.3-9.3)	7.2 (5.3-9.0)	6.8 (4.7-9.7)
Accelerometer							
Total activity, total activity counts/day	571,169 (460,080-692,913)	614,576 (514,952-728,539)	519,834 (426,428-652,380)	621,808 (514,700-742,328)	518,221 (426,858-643,682)	510,510 (424,732-625,630)	614,792 (505,328-728,539)
Total activity, MET-hrs/day	29.6 (28.3-31.1)	30 (28.9-31.5)	29 (27.9- 30.6)	30.2 (28.9-31.6)	28.9 (27.9-30.3)	28.8 (27.9-30.2)	30.1 (28.8-31.5)
MVPA, hr/day	0.6 (0.4-0.9)	0.7 (0.4-1.0)	0.5 (0.3- 0.8)	0.8 (0.5-1.0)	0.5 (0.3-0.7)	0.4 (0.3-0.7)	0.7 (0.4-1.0)
Sedentary, hr/day <sup>b</sup>	3.7 (2.7-4.6)	3.3 (2.4-4.3)	3.9 (3.0-4.9)	3.3 (2.4-4.2)	4.0 (3.1-5.0)	4 (3.1-5.1)	3.3 (2.5-4.3)
Doubly-labeled water							
Total energy expenditure, kcal/day	2159 (1943, 2421)	2026 (1856- 2259)	2276 (2047- 2557)	2291 (2078- 2549)	2027 (1847-2243)	2014 (1838-2214)	2274 (2043-2542)
Total Physical activity expenditure, kcal/day	687 (554, 851)	656 (547-838)	695 (558-864)	724 (590-899)	636 (512-792)	630 (507-778)	718 (585-893)
Resting Pulse rate, beats/minute	67 (62, 72)	67 (62-72)	72 (62-77)	67 (62-77)	67 (62-72)	67 (62-72)	67 (62-77)

BMI: Body Mass Index; NHS: Nurses' Health Study; MET: Metabolic Equivalent of Task; MVPA: Moderate to vigorous intensity physical activity. <sup>a</sup> includes active behavior;

<sup>b</sup>including bouts ≥ 15 minutes.

**Web Table 2: Distributions (Median, 25<sup>th</sup>-75<sup>th</sup> percentile) of the different physical activity measurements in the Women's Lifestyle Validation Study, United States, 2010-2012 (N=683)**

	N	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)
<b>DLW-Physical Activity Level, units</b>		
Measurement 1	683	1.7 (1.6-1.8)
Measurement 2	87	1.7 (1.6-1.9)
<b>PAEE, kcal/day</b>		
Measurement 1	683	687 (554-851)
Measurement 2	87	671 (519-841)
<b>TDEE, kcal/day</b>		
Measurement 1	683	2159 (1943-2421)
Measurement 2	87	2073 (1898-2355)
<b>DLW-body fat mass, %</b>		
Measurement 1	683	39 (34-44)
Measurement 2	87	38 (33-44)
<b>Total physical activity (not including sedentary)</b>		
PAQ 1, MET-hr/day	683	7.4 (5.1-10.5)
PAQ 2, MET-hr/day	683	7.5 (4.8-10.3)
ACT24 no.1, MET-hr/day	683	14.5 (9.8-20.8)
ACT24 no.2, MET-hr/day	616	15.2 (9.5-21.7)
ACT24 no.3, MET-hr/day	501	15 (10.1-20.6)
ACT24 no.4, MET-hr/day	268	15.2 (10.3-21.2)
Accelerometer no.1, total activity counts/day	683	571,169 (460,080-692,913)
Accelerometer no.2, total activity counts/day	662	572,205 (459,233-701,566)
Accelerometer no.1, MET-hr/day	683	29.6 (28.3-31.1)
Accelerometer no.2, MET-hr/day	662	29.6 (28.2-31.1)
<b>MVPA</b>		
PAQ 1, MET-hr/day	683	3.2 (1.4-6.0)
PAQ 2, MET-hr/day	683	3.0 (1.4-6.0)
ACT24 no.1, MET-hr/day	683	3.7 (0.6-9.0)
ACT24 no.2, MET-hr/day	616	4.5 (1.2-9.9)
ACT24 no.3, MET-hr/day	501	4.7 (1.4-11.1)
ACT24 no.4, MET-hr/day	268	4.7 (1.0-11.4)
Accelerometer no.1, hr/day	683	0.6 (0.4-0.9)
Accelerometer no.2, hr/day	662	0.6 (0.4-0.9)
<b>Vigorous Activity</b>		
PAQ 1, MET-hr/day	683	0.5 (0.1-2.2)
PAQ 2, MET-hr/day	683	0.6 (0.1-2.2)
ACT24 no.1, MET-hr/day	683	0 (0-0)
ACT24 no.2, MET-hr/day	616	0 (0-0)
ACT24 no.3, MET-hr/day	501	0 (0-0)



ACT24 no.4, MET-hr/day	268	0 (0-0)
Accelerometer no.1, hr/day	683	0 (0-0)
Accelerometer no.2, hr/day	662	0 (0-0)
<b>Moderate Activity</b>		
PAQ 1, MET-hr/day	683	1.9 (0.9-3.7)
PAQ 2, MET-hr/day	683	1.8 (0.8-3.7)
ACT24 no.1, MET-hr/day	683	3 (0.3-7.5)
ACT24 no.2, MET-hr/day	616	3.5 (0.6-7.8)
ACT24 no.3, MET-hr/day	501	3.5 (0.9-8.1)
ACT24 no.4, MET-hr/day	268	3.2 (0.3-8.4)
Accelerometer no.1, hr/day	683	0.6 (0.3-0.9)
Accelerometer no.2, hr/day	662	0.6 (0.3-0.8)
<b>Sedentary time</b>		
PAQ1, hr/day	681	3.2 (2.1-3.9)
PAQ2, hr/day	681	3.2 (2.2-3.8)
ACT24 no.1, hr/day	683	7 (4.9-9.3)
ACT24 no.2, hr/day	616	7.3 (5.1-9.3)
ACT24 no.3, hr/day	501	7.2 (5.0-9.4)
ACT24 no.4, hr/day	268	7.6 (5.5-9.8)
Accelerometer, including every minute		
Accelerometer no.1, hr/day	683	8 (7.1-8.9)
Accelerometer no.2, hr/day	662	8 (7.0-8.9)
Accelerometer, including bouts $\geq$ 15 minutes		
Accelerometer no.1, hr/day	683	3.7 (2.7-4.6)
Accelerometer no.2, hr/day	662	3.6 (2.7-4.6)
<b>RPR, beats/min</b>		
No.1	677	67 (62-72)
No.2	671	67 (62-72)
No.3	641	67 (62-72)
No.4	675	67 (62-72)

DLW: Doubly-labeled water; PAEE: Physical Activity Energy Expenditure; TEE: Total Energy Expenditure; PAQ: Physical Activity Questionnaire; MET: Metabolic Equivalent of Task; ACT24: Activities Completed Over Time in 24 hours; ACT24 (1-4): ACT24 collected in phases 1-4; MVPA: Moderate to vigorous intensity physical activity; RPR: Resting Pulse Rate.

**Web Table 3: Distributions (mean, standard deviation) of the different physical activity measurements in the Women's Lifestyle Validation Study, 2010-2012 (N=683) by BMI <25, ≥25 kg/m<sup>2</sup>, age (≤ 60, >60 years), and cohort (NHS, NHS2).**

	BMI		Age		Cohort	
	< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<b>DLW-PAL, units</b>						
Measurement 1	1.8 (0.2)	1.7 (0.2)	1.7 (0.2)	1.7 (0.2)	1.7 (0.2)	1.7 (0.2)
Measurement 2	1.8 (0.2)	1.7 (0.3)	1.8 (0.3)	1.7 (0.2)	1.7 (0.2)	1.7 (0.3)
<b>DLW body fat mass, %</b>						
Measurement 1	33 (6)	43 (6)	38 (8)	39 (7)	39 (7)	38 (8)
Measurement 2	33 (6)	42 (6)	37 (7)	39 (8)	39 (8)	38 (7)
<b>DLW determined TEE, kcal/day</b>						
Measurement 1	2067 (304)	2308 (368)	2324 (365)	2070 (307)	2045 (301)	2306 (360)
Measurement 2	2068 (295)	2235 (444)	2280 (452)	2039 (275)	1998 (272)	2271 (423)
<b>DLW determined PAEE, kcal/day</b>						
Measurement 1	695 (233)	722 (247)	758 (244)	662 (228)	657 (232)	748 (240)
Measurement 2	716 (215)	697 (336)	765 (325)	649 (229)	650 (245)	746 (306)
<b>Total physical activity (not including sedentary)</b>						
PAQ 1, MET-hr/day	9.1 (5.2)	7.4 (4.7)	8.7 (4.7)	7.7 (5.2)	7.4 (4.3)	8.8(5.4)
PAQ 2, MET-hr/day	8.9 (4.7)	7.4 (4.7)	9.0 (5.1)	7.3 (4.4)	7.2 (4.2)	8.8 (5.1)
ACT24 no.1, MET-hr/day	17.3 (9.3)	15.0 (8.8)	17.6 (10.1)	14.7 (7.9)	15.1 (7.9)	16.8 (9.9)
ACT24 no.2, MET-hr/day	17.7 (8.8)	15.5 (9.9)	17.9 (10.4)	15.3 (8.2)	15.1 (8.1)	17.6 (10.2)
ACT24 no.3, MET-hr/day	17.1 (8.2)	15.5 (8.5)	16.7 (9.1)	15.8 (7.6)	15.6 (7.3)	16.7 (9.1)
ACT24 no.4, MET-hr/day	17.0 (7.4)	15.4 (8.5)	17.0 (8.4)	15.2 (7.6)	15.3 (7.4)	16.6 (8.5)
Accelerometer no.1, total activity counts/day	634,888 (175,115)	546,308 (172,906)	635,071 (176,452)	542,823 (170,522)	533,800 (165,588)	628,598 (178,745)
Accelerometer no.2, total activity counts/day	633,839 (173,187)	540,741 (161,484)	634,734 (171,387)	537,391 (161,756)	526,026 (157,754)	629,352 (171,582)
<b>MVPA</b>						
PAQ 1, MET-hr/day	5.0 (4.8)	3.7 (4.0)	4.4 (4.1)	4.2 (4.8)	4.1 (3.7)	4.5 (4.9)
PAQ 2, MET-hr/day	4.9 (4.2)	3.7 (4.1)	4.5 (4.4)	4.0 (3.9)	3.9 (3.7)	4.5 (4.5)
ACT24 no.1, MET-hr/day	7.5 (8.9)	6.1 (8.1)	8.2 (9.7)	5.3 (6.8)	5.6 (7.0)	7.6 (9.4)
ACT24 no.2, MET-hr/day	8.2 (8.9)	6.9 (9.6)	8.7 (10.6)	6.4 (7.6)	6.4 (7.5)	8.3 (10.3)
ACT24 no.3, MET-hr/day	7.8 (7.5)	7.0 (8.3)	7.4 (8.6)	7.4 (7.3)	6.9 (6.9)	7.6 (8.6)
ACT24 no.4, MET-hr/day	7.7 (6.7)	6.8 (7.9)	7.9 (7.9)	6.4 (6.8)	6.3 (6.8)	7.7 (7.8)
Accelerometer no.1, hr/day	0.8 (0.5)	0.6 (0.4)	0.8 (0.4)	0.6 (0.4)	0.5 (0.4)	0.8 (0.5)
Accelerometer no.2, hr/day	0.8 (0.5)	0.6 (0.4)	0.8 (0.4)	0.5 (0.4)	0.5 (0.4)	0.8 (0.4)
<b>Vigorous Activity</b>						
PAQ 1, MET-hr/day	1.8 (2.6)	1.3 (2.6)	1.8 (2.7)	1.4 (2.4)	1.3 (2.2)	1.8 (2.8)
PAQ 2, MET-hr/day	1.7 (2.8)	1.4 (2.3)	1.9 (3.0)	1.2 (2.0)	1.2 (1.9)	1.8 (2.9)
ACT24 no.1, MET-hr/day	1.1 (2.8)	0.8 (2.7)	1.1 (3.0)	0.8 (2.5)	0.9 (2.7)	0.9 (2.8)
ACT24 no.2, MET-hr/day	1.7 (4.5)	1.1 (4.1)	1.7 (4.8)	1.1 (3.7)	1.0 (3.8)	1.6 (4.6)
ACT24 no.3, MET-hr/day	1.8 (4.4)	1.1 (3.4)	1.5 (4.0)	1.4 (3.9)	1.4 (4.0)	1.5 (3.9)

	BMI		Age		Cohort	
	< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
ACT24 no.4, MET-hr/day	1.1 (2.8)	1.6 (4.1)	1.9 (3.9)	1.0 (3.2)	0.9 (3.3)	1.7 (3.8)
Accelerometer no.1, hr/day	0.1 (0.1)	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.0 (0.1)	0.1 (0.1)
Accelerometer no.2, hr/day	0.05 (0.1)	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.0 (0.1)	0.1 (0.1)
<b>Moderate Activity</b>						
PAQ 1, MET-hr/day	3.2 (3.2)	2.3 (2.5)	2.6 (2.4)	2.8 (3.3)	2.8 (2.7)	2.7 (3.0)
PAQ 2, MET-hr/day	3.2 (2.8)	2.3 (2.7)	2.7 (2.6)	2.8 (3.0)	2.8 (2.8)	2.7 (2.8)
ACT24 no.1, MET-hr/day	6.5 (8.6)	5.3 (7.5)	7.1 (9.5)	4.5 (6.1)	4.7 (6.2)	6.7 (9.1)
ACT24 no.2, MET-hr/day	6.5 (7.7)	5.8 (8.8)	7.0 (10.0)	5.3 (6.5)	5.4 (6.5)	6.7 (9.3)
ACT24 no.3, MET-hr/day	6.0 (6.3)	5.9 (7.8)	5.9 (7.6)	6.0 (6.7)	5.6 (6.1)	6.2 (7.8)
ACT24 no.4, MET-hr/day	6.6 (6.4)	5.2 (7.1)	6.1 (7.6)	5.4 (5.9)	5.3 (5.8)	6.0 (7.5)
Accelerometer no.1, hr/day	0.7 (0.4)	0.6 (0.4)	0.7 (0.4)	0.5 (0.4)	0.5 (0.4)	0.7 (0.4)
Accelerometer no.2, hr/day	0.7 (0.4)	0.6 (0.4)	0.8 (0.4)	0.5 (0.4)	0.5 (0.3)	0.7 (0.4)
<b>Sedentary time</b>						
PAQ1, hr/day	3.1 (1.2)	3.1 (1.3)	3.2 (1.3)	2.9 (1.2)	2.9 (1.2)	3.2 (1.3)
PAQ2, hr/day	3.1 (1.3)	3.0 (1.3)	3.1 (1.4)	3.0 (1.2)	2.9 (1.1)	3.2 (1.4)
ACT24 no.1, hr/day	6.7 (3.0)	7.5 (3.3)	7.0 (3.3)	7.2 (3.1)	7.1 (3.0)	7.1 (3.4)
ACT24 no.2, hr/day	7.0 (2.9)	7.5 (3.3)	7.3 (3.3)	7.2 (2.9)	7.3 (2.9)	7.3 (3.2)
ACT24 no.3, hr/day	7.3 (2.9)	7.2 (3.1)	7.1 (3.2)	7.3 (2.8)	7.3 (2.8)	7.2 (3.1)
ACT24 no.4, hr/day	7.3 (2.9)	7.7 (3.2)	7.6 (3.3)	7.5 (2.9)	7.3 (2.9)	7.7 (3.2)
<b>Accelerometer, including every minute</b>						
Accelerometer no.1, hr/day	7.7 (1.4)	8.2 (1.4)	7.9 (1.4)	8.0 (1.4)	8.0 (1.4)	7.9 (1.4)
Accelerometer no.2, hr/day	7.7 (1.4)	8.2 (1.4)	7.8 (1.5)	8.0 (1.4)	8.0 (1.4)	7.9 (1.5)
<b>Accelerometer, including bouts ≥ 15 minutes</b>						
Accelerometer no.1, hr/day	3.4 (1.3)	4.0 (1.5)	3.4 (1.4)	4.0 (1.4)	4.1 (1.4)	3.5 (1.4)
Accelerometer no.2, hr/day	3.4 (1.3)	4.0 (1.5)	3.3 (1.3)	4.1 (1.5)	4.1 (1.4)	3.4 (1.4)
<b>RPR, beats/min</b>						
No.1	67 (8)	70 (9)	69 (9)	68 (8)	68 (8)	69 (9)
No.2	69 (8)	70 (8)	70 (8)	69 (7)	68 (7)	70 (8)
No.3	68 (8)	69 (8)	69 (8)	68 (7)	68 (7)	69 (8)
No.4	68 (8)	69 (8)	69 (9)	68 (8)	68 (8)	69 (8)

DLW: Doubly Labelled Water; PAL: Physical Activity Level; TEE: Total Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; MET: Metabolic Equivalent of Task; ACT24: Activities Completed Over Time in 24 hours; RPR: Resting Pulse Rate.

**Web Table 4: Distributions (median, 25<sup>th</sup>- 75<sup>th</sup> percentile) of the different physical activity measurements in the Women's Lifestyle Validation Study, 2010-2012 (N=683) by BMI <25, ≥25 kg/m2), age (≤ 60, >60 years), and cohort (NHS, NHS2).**

	BMI		Age		Cohort	
	< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)	Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)
<b>DLW-PAL, units</b>						
Measurement 1	1.7 (1.6-1.9)	1.7 (1.6-1.8)	1.7 (1.6-1.9)	1.7 (1.6-1.8)	1.7 (1.6, 1.8)	1.7 (1.6, 1.9)
Measurement 2	1.8 (1.6-1.9)	1.6 (1.5-1.8)	1.7 (1.6-1.9)	1.7 (1.6-1.9)	1.7 (1.6, 1.9)	1.7 (1.6, 1.9)
<b>DLW body fat mass, %</b>						
Measurement 1	34 (30-38)	43 (39-47)	38 (32-43)	40 (35-44)	40 (35-44)	38 (32-43)
Measurement 2	33 (30-37)	43 (38-46)	36 (32-43)	40 (36-44)	40 (34-44)	37 (32-44)
<b>DLW determined TEE, kcal/day</b>						
Measurement 1	2026 (1856-2259)	2276 (2047-2557)	2291 (2078-2549)	20275 (1847-2243)	2014 (1838, 2214)	2274 (2043, 2542)
Measurement 2	2025 (1866-2182)	2120 (1965-2477)	2157 (1983-2492)	2012 (1840-2147)	1966 (1810, 2126)	2151 (2001, 2477)
<b>DLW determined PAEE, kcal/day</b>						
Measurement 1	656 (547-838)	695 (558-864)	724 (590-899)	636 (512-792)	630 (507, 778)	718 (585, 893)
Measurement 2	716 (552-855)	640 (507-828)	730 (562-885)	636 (462-810)	616 (462, 812)	691 (562, 849)
<b>Total physical activity (not including sedentary)</b>						
PAQ 1, MET-hr/day	8.4 (6-10.9)	6.7 (4.1-9.7)	8.2 (5.6-11.3)	6.8 (4.5-9.9)	6.7 (4.4, 9.8)	8.1 (5.6, 11.3)
PAQ 2, MET-hr/day	8.1 (5.8-11.1)	6.8 (4.1-9.5)	8.4 (5.7-11.0)	6.6 (4.2-9.5)	6.5 (4.1, 9.5)	8.1 (5.6, 10.8)
ACT24 no.1, MET-hr/day	15.9 (10.6-22.2)	13.6 (9.4-19.2)	16.1 (10.5-22.5)	13.1 (9.5-19)	13.3 (10, 19.1)	15.5 (9.6, 22.2)
ACT24 no.2, MET-hr/day	16.6 (11-22.2)	13.5 (8.2-20.9)	16.0 (9.9-23.0)	14.1 (9.0-19.5)	13.7 (9, 19.5)	15.8 (9.9, 22.6)
ACT24 no.3, MET-hr/day	16.1 (11.3-21.3)	13.8 (9.4-20.2)	14.7 (10.1-22.2)	15.3 (10.1-19.8)	15.3 (10, 19.7)	14.6 (10.2, 22)
ACT24 no.4, MET-hr/day	16.3 (12.3-21.3)	14.1 (9.3-21.0)	16.0 (10.3-22.1)	14.7 (10.1-19.8)	14.7 (10.1, 19.8)	16 (10.3, 22)
Accelerometer no.1, total activity counts/day	614576 (514952-728539)	519834 (426428-652380)	621808 (514700-742328)	518221 (426858-643682)	510510 (4247328, 625630)	614792 (505328, 728539)
Accelerometer no.2, total activity counts/day	621476 (512607-745571)	537472 (413637-641168)	623289 (520909-748382)	530588 (413238-635848)	518990 (405922, 610016)	621472 (517877, 745105)
Accelerometer no.1, MET-hr/day	30.0 (28.9-31.5)	29 (27.9-30.6)	30.2 (28.9-31.6)	28.9 (27.9-30.3)	28.8 (27.9, 30.2)	30.1 (28.8, 31.5)
Accelerometer no.2, MET-hr/day	30.1 (28.8-31.7)	29.2 (27.7-30.4)	30.3 (28.9-31.7)	29.1 (27.7-30.3)	28.9 (27.6, 30.1)	30.2 (28.9, 31.7)

**MVPA**

PAQ 1, MET-hr/day	3.9 (2-6.7)	2.4 (1.0-5.2)	3.4 (1.5-6.2)	2.9 (1.4-5.9)	2.9 (1.4, 5.9)	3.4 (1.5, 6.1)
PAQ 2, MET-hr/day	3.9 (1.9-6.9)	2.5 (1.0-5.0)	3.3 (1.4-6.4)	2.9 (1.3-5.7)	2.8 (1.3, 5.8)	3.2 (1.4, 6.3)
ACT24 no.1, MET-hr/day	4.6 (1.5-10.3)	3.2 (0.0-8.2)	4.3 (0.9-12)	3.2 (0.1-6.7)	3.3 (0.3, 7.6)	4.2 (0.6, 10.5)
ACT24 no.2, MET-hr/day	5.3 (2.0-10.9)	3.7 (0.0-9.1)	5.0 (1.4-11.1)	4.0 (0.9-8.9)	4.0 (1.5, 8.6)	5.0 (1.1, 11.4)
ACT24 no.3, MET-hr/day	5.9 (2.2-12.0)	4.0 (1.1-9.4)	3.9 (1.2-10.5)	5.4 (2.0-11.3)	5.0 (1.8, 11.1)	4.4 (1.3, 11.1)
ACT24 no.4, MET-hr/day	7 (1.9-12.8)	3.8 (0.3-10.2)	5.5 (1.1-12.8)	3.9 (1.0-9.2)	3.8 (1.2, 9.2)	5.5 (1, 12.8)
Accelerometer no.1, hr/day	0.7 (0.4-1.0)	0.5 (0.3-0.8)	0.8 (0.5-1.0)	0.5 (0.3-0.7)	0.4 (0.3, 0.7)	0.7 (0.4, 1)
Accelerometer no.2, hr/day	0.7 (0.4-1.0)	0.5 (0.3-0.8)	0.7 (0.5-1.1)	0.5 (0.2-0.7)	0.4 (0.2, 0.7)	0.7 (0.5, 1.1)

**Vigorous Activity**

PAQ 1, MET-hr/day	0.9 (0.1-2.5)	0.2 (0.0-1.4)	0.8 (0.1-2.4)	0.3 (0.0-2.1)	0.2 (0, 1.7)	0.8 (0.1, 2.4)
PAQ 2, MET-hr/day	0.8 (0.1-2.3)	0.3 (0.1-2.1)	0.9 (0.1-2.4)	0.3 (0.0-1.7)	0.2 (0, 1.4)	0.9 (0.1, 2.3)
ACT24 no.1, MET-hr/day	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0, 0)	0 (0, 0)
ACT24 no.2, MET-hr/day	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0, 0)	0 (0, 0)
ACT24 no.3, MET-hr/day	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0, 0)	0 (0, 0)
ACT24 no.4, MET-hr/day	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0, 0)	0 (0, 0)
Accelerometer no.1, hr/day	0 (0-0)	0 (0-0)	0 (0-0.1)	0 (0-0)	0 (0, 0)	0 (0, 0.1)
Accelerometer no.2, hr/day	0 (0-0)	0 (0-0)	0 (0-0.1)	0 (0-0)	0 (0, 0)	0 (0, 0)

**Moderate Activity**

PAQ 1, MET-hr/day	2.4 (1.3-4.4)	1.4 (0.6-3.2)	2.0 (0.8-3.5)	1.7 (0.9-4.1)	1.7 (0.9, 4.2)	2.0 (0.8, 3.5)
PAQ 2, MET-hr/day	2.3 (1.2-4.6)	1.5 (0.6-3.0)	1.8 (0.8-3.6)	1.9 (0.8-3.9)	1.9 (0.8, 4.0)	1.8 (0.8, 3.6)
ACT24 no.1, MET-hr/day	3.6 (1.1-8.3)	2.6 (0.0-6.5)	3.3 (0.6-9.2)	2.5 (0.0-6.1)	2.7 (0.0, 6.3)	3.2 (0.5, 8.7)
ACT24 no.2, MET-hr/day	4.3 (1.5-8.3)	2.6 (0.0-6.8)	3.8 (0.4-8.2)	3.1 (0.6-7.3)	3.3 (1.2, 7.2)	3.7 (0.3, 8.3)
ACT24 no.3, MET-hr/day	4 (1.2-8.6)	3.2 (0.3-7.6)	2.9 (0.6-8.0)	4.1 (1.1-8.5)	3.8 (0.9, 7.7)	3.5 (0.8, 8.4)
ACT24 no.4, MET-hr/day	4.9 (1.2-10.2)	2.7 (0.0-6.7)	3.3 (0.0-9.9)	3.2 (0.9-8.2)	3.2 (0.9, 8.3)	3.2 (0.0, 9.7)
Accelerometer no.1, hr/day	0.6 (0.4-1.0)	0.5 (0.3-0.8)	0.7 (0.4-1.0)	0.5 (0.3-0.7)	0.4 (0.2, 0.7)	0.7 (0.4, 0.9)
Accelerometer no.2, hr/day	0.7 (0.4-0.9)	0.5 (0.3-0.8)	0.7 (0.5-1.0)	0.4 (0.2-0.7)	0.4 (0.2, 0.7)	0.7 (0.5, 1.0)

**Sedentary time**

PAQ1, hr/day	3.2 (2.1-3.8)	3.4 (2.1-3.9)	3.4 (2.3-4.2)	3.0 (2.1-3.7)	3.0 (2.1, 3.6)	3.6 (2.3, 4.2)
PAQ2, hr/day	3.4 (2.3-3.9)	3.2 (2.1-3.7)	3.2 (2.1-4.2)	3.2 (2.4-3.7)	3.0 (2.4, 3.6)	3.4 (2.1, 4.3)
ACT24 no.1, hr/day	6.6 (4.8-8.8)	7.3 (5.1-9.9)	6.7 (4.6-9.5)	7.3 (5.3-9.3)	7.2 (5.3, 9.0)	6.8 (4.7, 9.7)
ACT24 no.2, hr/day	6.9 (5.2-8.9)	7.6 (5.1-9.9)	7.1 (4.9-9.7)	7.3 (5.2-9.2)	7.3 (5.3, 9.2)	7.0 (4.8, 9.5)
ACT24 no.3, hr/day	7.3 (5.3-9.4)	7.1 (4.9-9.5)	6.8 (4.9-9.5)	7.5 (5.3-9.3)	7.5 (5.2, 9.4)	6.9 (4.9, 9.5)
ACT24 no.4, hr/day	7.4 (5.1-8.9)	8 (5.8-10.0)	7.8 (5.3-10.0)	7.6 (5.8-9.3)	7.2 (5.6, 9.3)	8.2 (5.4, 10.0)

<b>Accelerometer, including every minute</b>						
Accelerometer no.1, hr/day	7.7 (6.8-8.6)	8.1 (7.3-9.1)	7.9 (7.0-8.9)	8.0 (7.1-8.9)	8.0 (7.2, 8.9)	7.9 (7, 8.8)
Accelerometer no.2, hr/day	7.6 (6.7-8.6)	8.3 (7.3-9.1)	7.8 (6.9-8.8)	8.0 (7.1-8.9)	8.1 (7.1, 8.9)	7.8 (6.9, 8.9)
<b>Accelerometer, including bouts ≥ 15 minutes</b>						
Accelerometer no.1, hr/day	3.3 (2.4-4.3)	3.9 (3.0-4.9)	3.3 (2.4-4.2)	4.0 (3.1-5)	4.0 (3.1, 5.1)	3.4 (2.5, 4.3)
Accelerometer no.2, hr/day	3.3 (2.5-4.3)	3.8 (2.9-5.0)	3.2 (2.4-4.2)	4.0 (3.1-5)	4.0 (3.1, 5.1)	3.3 (2.5, 4.3)
<b>RPR, beats/min</b>						
No.1	67 (62-72)	72 (62-77)	67 (62-77)	67 (62-72)	67 (62, 72)	67 (62, 77)
No.2	67 (62-72)	67 (62-77)	67 (62-77)	67 (62-72)	67 (62, 72)	67 (62, 77)
No.3	67 (62-72)	67 (62-72)	67 (62-72)	67 (62-72)	67 (62, 72)	67 (62, 72)
No.4	67 (62-72)	67 (62-72)	67 (62-72)	67 (62-72)	67 (62, 72)	67 (62, 72)

DLW: Doubly Labelled Water; PAL: Physical Activity Level; TEE: Total Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; MET: Metabolic Equivalent of Task; ACT24: Activities Completed Over Time in 24 hours; RPR: Resting Pulse Rate.

**Web Table 5: Intra-class correlations (95% confidence interval) of the different physical activity measurements in the Women's Lifestyle Validation Study, 2010-2012 (N=683), by BMI <25, ≥25 kg/m<sup>2</sup>, age (≤ 60, >60 years), and cohort (NHS, NHS2).**

ICC (95% CI)	BMI (kg/m <sup>2</sup> )		Age (years)		Cohort	
	< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
<b>DLW-Physical Activity Level, units</b>						
Measurement 1	0.56 (0.36, 0.74)	0.55 (0.39, 0.70)	0.43 (0.24, 0.63)	0.72 (0.58, 0.83)	0.70 (0.54, 0.82)	0.46 (0.29, 0.65)
Measurement 2						
<b>DLW body fat mass, %</b>						
Measurement 1	0.68 (0.50, 0.81)	0.75 (0.63, 0.85)	0.91 (0.86, 0.94)	0.74 (0.61, 0.84)	0.71 (0.55, 0.83)	0.90 (0.85, 0.94)
Measurement 2						
<b>TDEE, kcal/day</b>						
Measurement 1	0.66 (0.49, 0.80)	0.75 (0.64, 0.84)	0.66 (0.51, 0.78)	0.78 (0.66, 0.86)	0.73 (0.57, 0.85)	0.69 (0.56, 0.80)
Measurement 2						
<b>PAEE, kcal/day</b>						
Measurement 1	0.22 (0.06, 0.55)	0.68 (0.54, 0.80)	0.20 (0.06, 0.49)	0.78 (0.67, 0.87)	0.77 (0.63, 0.86)	0.23 (0.08, 0.49)
Measurement 2						
<b>Total physical activity (not including sedentary)</b>						
PAQ 1, MET-hr/day	0.40 (0.31, 0.49)	0.70 (0.65, 0.75)	0.74 (0.69, 0.79)	0.47 (0.39, 0.55)	0.44 (0.36, 0.54)	0.73 (0.68, 0.77)
PAQ 2, MET-hr/day						
ACT24 (1), MET-hr/day						
ACT24 (2), MET-hr/day	0.58 (0.50, 0.66)	0.33 (0.26, 0.40)	0.47 (0.38, 0.55)	0.36 (0.29, 0.43)	0.36 (0.29, 0.43)	0.46 (0.38, 0.53)
ACT24 (3), MET-hr/day						
ACT24 (4), MET-hr/day						
Accelerometer no.1, total activity counts/day	0.74 (0.68, 0.78)	0.78 (0.74, 0.82)	0.73 (0.68, 0.78)	0.79 (0.75, 0.83)	0.78 (0.73, 0.82)	0.75 (0.70, 0.79)
Accelerometer no.2, total activity counts/day						
<b>MVPA</b>						
PAQ 1, MET-hr/day	0.56 (0.48, 0.63)	0.76 (0.71, 0.80)	0.80 (0.76, 0.83)	0.63 (0.57, 0.69)	0.66 (0.59, 0.72)	0.75 (0.71, 0.79)
PAQ 2, MET-hr/day						
ACT24 (1), MET-hr/day						
ACT24 (2), MET-hr/day	0.13 (0.07, 0.21)	0.19 (0.13, 0.26)	0.17 (0.11, 0.25)	0.19 (0.13, 0.27)	0.19 (0.12, 0.28)	0.18 (0.13, 0.25)
ACT24 (3), MET-hr/day						
ACT24 (4), MET-hr/day						
Accelerometer no.1, hr/day	0.75 (0.70, 0.79)	0.77 (0.73, 0.81)	0.73 (0.68, 0.78)	0.75 (0.70, 0.80)	0.73 (0.67, 0.78)	0.76 (0.72, 0.80)
Accelerometer no.2, hr/day						
<b>Vigorous Activity</b>						
PAQ 1, MET-hr/day	0.68 (0.62, 0.74)	0.65 (0.59, 0.71)	0.66 (0.60, 0.72)	0.65 (0.59, 0.71)	0.68 (0.61, 0.74)	0.62 (0.56, 0.68)
PAQ 2, MET-hr/day						

ICC (95% CI)	BMI (kg/m <sup>2</sup> )		Age (years)		Cohort	
	< 25 (N=322)	≥ 25 (N=361)	≤60 (N=335)	>60 (N=348)	NHS (N=292)	NHS II (N=391)
ACT24 (1), MET-hr/day						
ACT24 (2), MET-hr/day	0.21 (0.15, 0.29)	0.21 (0.15, 0.29)	0.22 (0.16, 0.29)	0.20 (0.14, 0.28)	0.24 (0.17, 0.32)	0.20 (0.14, 0.27)
ACT24 (3), MET-hr/day						
ACT24 (4), MET-hr/day						
Accelerometer no.1, hr/day	0.66 (0.60, 0.72)	0.49 (0.41, 0.57)	0.59 (0.51, 0.66)	0.54 (0.46, 0.61)	0.50 (0.42, 0.59)	0.59 (0.52, 0.65)
Accelerometer no.2, hr/day						
<b>Moderate Activity</b>						
PAQ 1, MET-hr/day	0.51 (0.43, 0.59)	0.66 (0.60, 0.72)	0.73 (0.68, 0.78)	0.57 (0.50, 0.64)	0.59 (0.52, 0.67)	0.68 (0.63, 0.73)
PAQ 2, MET-hr/day						
ACT24 (1), MET-hr/day						
ACT24 (2), MET-hr/day	0.07 (0.03, 0.17)	0.20 (0.14, 0.28)	0.14 (0.09, 0.21)	0.20 (0.14, 0.28)	0.19 (0.13, 0.28)	0.15 (0.10, 0.22)
ACT24 (3), MET-hr/day						
ACT24 (4), MET-hr/day						
Accelerometer no.1, hr/day	0.73 (0.68, 0.78)	0.76 (0.72, 0.80)	0.70 (0.65, 0.76)	0.75 (0.70, 0.79)	0.73 (0.67, 0.78)	0.74 (0.69, 0.78)
Accelerometer no.2, hr/day						
<b>Sedentary time</b>						
PAQ1, hr/day	0.38 (0.29, 0.48)	0.33 (0.24, 0.43)	0.51 (0.44, 0.59)	0.27 (0.18, 0.38)	0.25 (0.15, 0.37)	0.50 (0.43, 0.58)
PAQ2, hr/day						
ACT24 (1), hr/day						
ACT24 (2), hr/day						
ACT24 (3), hr/day	0.59 (0.51, 0.67)	0.30 (0.24, 0.36)	0.78 (0.73, 0.82)	0.27 (0.21, 0.34)	0.27 (0.20, 0.35)	0.75 (0.70, 0.79)
ACT24 (4), hr/day						
<b>Accelerometer, including every minute</b>						
Accelerometer no.1, hr/day	0.69 (0.63, 0.75)	0.67 (0.61, 0.73)	0.64 (0.58, 0.71)	0.74 (0.69, 0.78)	0.75 (0.69, 0.80)	0.65 (0.59, 0.71)
Accelerometer no.2, hr/day						
<b>Accelerometer, including bouts ≥ 15 minutes</b>						
Accelerometer no.1, hr/day	0.71 (0.66, 0.76)	0.68 (0.62, 0.73)	0.62 (0.55, 0.69)	0.77 (0.72, 0.81)	0.77 (0.72, 0.82)	0.64 (0.58, 0.70)
Accelerometer no.2, hr/day						
<b>RPR, beats/min</b>						
No.1						
No.2						
No.3	0.63 (0.58, 0.68)	0.56 (0.51, 0.61)	0.60 (0.55, 0.65)	0.59 (0.54, 0.64)	0.58 (0.52, 0.63)	0.61 (0.56, 0.65)
No.4						

DLW: Doubly-labeled Water; PAL: Physical Activity Level; TEE: Total Daily Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; ACT24: Activities Completed Over Time in 24 hours; RPR: Resting Pulse Rate.



**Web Table 6: Age adjusted and deattenuated Spearman correlation coefficients comparing physical activity questionnaires and 24 hours recalls to doubly-labeled water determined physical activity energy expenditure and total energy expenditure in Women's Lifestyle Validation Study (N=683), 2010-2012.**

	DLW-determined PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>						
PAQ1	0.32	0.39 (0.31, 0.47)	0.25	0.32 (0.22, 0.40)	0.07	0.08 (0.00, 0.16)
PAQ2	0.34	0.41 (0.33, 0.49)	0.28	0.34 (0.25, 0.43)	0.08	0.09 (0.01, 0.17)
PAQ <sub>avg</sub>	0.35	0.43 (0.35, 0.51)	0.28	0.35 (0.26, 0.43)	0.08	0.09 (0.01, 0.17)
ACT24 (1)	0.26	0.32 (0.23, 0.40)	0.20	0.26 (0.16, 0.35)	0.05	0.06 (-0.03, 0.14)
ACT24 (2)	0.22	0.28 (0.18, 0.37)	0.16	0.21 (0.11, 0.30)	0.00	0.00 (-0.09, 0.09)
ACT24 (3)	0.24	0.29 (0.19, 0.38)	0.21	0.26 (0.15, 0.37)	0.09	0.10 (0.01, 0.20)
ACT24 (4)	0.22	0.25 (0.11, 0.38)	0.19	0.21 (0.07, 0.35)	0.07	0.08 (-0.05, 0.21)
ACT24 <sub>avg</sub>	0.32	0.39 (0.30, 0.47)	0.25	0.31 (0.22, 0.39)	0.06	0.06 (-0.02, 0.14)
<b>MVPA (MET-hrs/day)</b>						
PAQ1	0.31	0.39 (0.30, 0.47)	0.24	0.29 (0.2, 0.38)	0.05	0.06 (-0.02, 0.14)
PAQ2	0.33	0.40 (0.31, 0.48)	0.26	0.32 (0.23, 0.4)	0.07	0.08 (0.00, 0.16)
PAQ <sub>avg</sub>	0.34	0.41 (0.33, 0.49)	0.26	0.32 (0.23, 0.4)	0.07	0.07 (-0.01, 0.15)
ACT24 (1)	0.22	0.28 (0.18, 0.37)	0.19	0.24 (0.15, 0.33)	0.07	0.08 (0.00, 0.16)
ACT24 (2)	0.17	0.21 (0.11, 0.30)	0.12	0.15 (0.05, 0.24)	-0.03	-0.04 (-0.12, 0.05)
ACT24 (3)	0.19	0.23 (0.12, 0.34)	0.16	0.20 (0.10, 0.31)	0.06	0.07 (-0.02, 0.17)
ACT24 (4)	0.15	0.17 (0.03, 0.31)	0.13	0.15 (0.01, 0.29)	0.04	0.04 (-0.09, 0.17)
ACT24 <sub>avg</sub>	0.26	0.31 (0.22, 0.39)	0.21	0.26 (0.16, 0.35)	0.04	0.04 (-0.04, 0.12)
<b>Vigorous activity (MET-hrs/day)</b>						
PAQ1	0.20	0.25 (0.16, 0.34)	0.14	0.18 (0.09, 0.27)	0.00	0.01 (-0.08, 0.09)
PAQ2	0.22	0.26 (0.17, 0.35)	0.17	0.21 (0.11, 0.30)	0.04	0.04 (-0.04, 0.12)
PAQ <sub>avg</sub>	0.21	0.26 (0.17, 0.35)	0.16	0.20 (0.11, 0.29)	0.03	0.03 (-0.05, 0.11)
ACT24 (1)	0.12	0.15 (0.07, 0.24)	0.13	0.17 (0.08, 0.26)	0.07	0.09 (0.00, 0.17)
ACT24 (2)	0.07	0.08 (-0.01, 0.17)	0.07	0.09 (-0.01, 0.18)	0.02	0.02 (-0.07, 0.11)
ACT24 (3)	0.05	0.06 (-0.05, 0.16)	0.03	0.03 (-0.07, 0.14)	-0.05	-0.05 (-0.15, 0.05)
ACT24 (4)	0.08	0.09 (-0.05, 0.23)	0.09	0.10 (-0.04, 0.24)	0.05	0.06 (-0.08, 0.19)
ACT24 <sub>avg</sub>	0.15	0.19 (0.10, 0.27)	0.13	0.16 (0.07, 0.25)	0.05	0.06 (-0.02, 0.14)
<b>Moderate activity (MET-hrs/day)</b>						
PAQ1	0.27	0.33 (0.24, 0.41)	0.20	0.25 (0.16, 0.34)	0.04	0.05 (-0.04, 0.13)
PAQ2	0.28	0.34 (0.25, 0.42)	0.22	0.26 (0.17, 0.36)	0.05	0.05 (-0.03, 0.13)
PAQ <sub>avg</sub>	0.29	0.36 (0.27, 0.44)	0.22	0.28 (0.18, 0.37)	0.05	0.06 (-0.03, 0.13)
ACT24 (1)	0.18	0.22 (0.13, 0.31)	0.16	0.19 (0.11, 0.28)	0.05	0.06 (-0.03, 0.13)
ACT24 (2)	0.13	0.16 (0.07, 0.25)	0.07	0.09 (-0.01, 0.18)	-0.07	-0.07 (-0.16, 0.01)
ACT24 (3)	0.16	0.19 (0.09, 0.30)	0.14	0.18 (0.08, 0.29)	0.08	0.09 (-0.01, 0.18)
ACT24 (4)	0.12	0.14 (0.00, 0.28)	0.10	0.11 (-0.03, 0.25)	0.03	0.03 (-0.11, 0.16)

	DLW-determined PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
ACT24 <sub>avg</sub>	0.21	0.26 (0.16, 0.35)	0.16	0.20 (0.11, 0.29)	0.01	0.01 (-0.07, 0.10)
<b>Sedentary time (hrs/day)</b>						
PAQ1	-0.04	-0.06 (-0.14, 0.03)	-0.02	-0.03 (-0.12, 0.06)	0.01	0.01 (-0.08, 0.10)
PAQ2	-0.01	-0.02 (-0.11, 0.07)	-0.01	-0.01 (-0.11, 0.08)	-0.01	-0.01 (-0.10, 0.08)
PAQ <sub>avg</sub>	-0.03	-0.04 (-0.12, 0.06)	-0.01	-0.02 (-0.11, 0.08)	0.00	0.00 (-0.09, 0.09)
ACT24 (1)	-0.09	-0.11 (-0.19, -0.02)	-0.05	-0.07 (-0.15, 0.03)	0.02	0.02 (-0.07, 0.11)
ACT24 (2)	-0.11	-0.14 (-0.23, -0.05)	-0.08	-0.09 (-0.19, 0.00)	0.00	0.00 (-0.09, 0.09)
ACT24 (3)	-0.13	-0.17 (-0.27, -0.07)	-0.16	-0.20 (-0.30, -0.10)	-0.15	-0.17 (-0.26, -0.08)
ACT24 (4)	-0.11	-0.13 (-0.27, 0.01)	-0.12	-0.13 (-0.27, 0.01)	-0.09	-0.10 (-0.22, 0.04)
ACT24 <sub>avg</sub>	-0.12	-0.15 (-0.24, -0.06)	-0.10	-0.12 (-0.21, -0.03)	0.01	-0.02 (-0.10, 0.07)

DLW: Doubly-labeled Water; PAL: Physical Activity Level; TEE: Total Daily Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; ACT24: Activities Completed Over Time in 24 hours; ACT24 (1-4): ACT24 collected in Phases 1-4; MVPA: moderate to vigorous intensity physical activity.

**Web Table 7: Age adjusted and deattenuated Spearman Correlation Coefficients comparing physical activity questionnaire and 24 hours recalls to doubly-labeled water determined physical activity level (PAL), physical activity energy expenditure (PAEE), and total energy expenditure (TEE) by BMI (< 25, >=25 kg/m<sup>2</sup>) among participants of Women's Lifestyle Validation Study, 2010-2012.**

	DLW-PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>						
<b>BMI &lt;25 kg/m<sup>2</sup></b>						
PAQ1	0.29	0.38 (0.23, 0.51)	0.29	0.39 (0.24, 0.53)	0.26	0.33 (0.19, 0.45)
PAQ2	0.28	0.35 (0.20, 0.48)	0.29	0.36 (0.20, 0.50)	0.22	0.27 (0.13, 0.39)
PAQ <sub>avg</sub>	0.3	0.39 (0.24, 0.52)	0.31	0.40 (0.25, 0.54)	0.26	0.32 (0.18, 0.44)
ACT24 (2)	0.14	0.19 (0.04, 0.33)	0.14	0.19 (0.04, 0.34)	0.09	0.12 (-0.03, 0.26)
ACT24 <sub>avg</sub>	0.23	0.30 (0.15, 0.43)	0.20	0.27 (0.11, 0.40)	0.11	0.14 (0.00, 0.27)
<b>BMI ≥25 kg/m<sup>2</sup></b>						
PAQ1	0.31	0.36 (0.24, 0.47)	0.25	0.30 (0.17, 0.40)	0.08	0.09 (-0.02, 0.20)
PAQ2	0.35	0.41 (0.29, 0.51)	0.29	0.35 (0.23, 0.46)	0.12	0.14 (0.03, 0.24)
PAQ <sub>avg</sub>	0.36	0.41 (0.30, 0.52)	0.29	0.35 (0.23, 0.46)	0.11	0.12 (0.01, 0.23)
ACT24 (2)	0.26	0.30 (0.18, 0.41)	0.20	0.24 (0.11, 0.36)	0.07	0.06 (-0.06, 0.17)
ACT24 <sub>avg</sub>	0.37	0.41 (0.29, 0.52)	0.31	0.37 (0.25, 0.47)	0.15	0.16 (0.05, 0.27)
<b>MVPA (MET-hrs/day)</b>						
<b>BMI &lt;25 kg/m<sup>2</sup></b>						
PAQ1	0.30	0.39 (0.24, 0.52)	0.32	0.41 (0.25, 0.54)	0.29	0.36 (0.23, 0.49)
PAQ2	0.31	0.35 (0.19, 0.49)	0.32	0.36 (0.19, 0.51)	0.27	0.30 (0.16, 0.43)
PAQ <sub>avg</sub>	0.32	0.39 (0.23, 0.52)	0.33	0.40 (0.23, 0.54)	0.29	0.35 (0.20, 0.47)
ACT24 (2)	0.10	0.13 (-0.02, 0.27)	0.11	0.15 (0.00, 0.30)	0.08	0.11 (-0.04, 0.25)
ACT24 <sub>avg</sub>	0.17	0.21 (0.07, 0.35)	0.16	0.2 (0.06, 0.35)	0.09	0.11 (-0.03, 0.24)
<b>BMI ≥25 kg/m<sup>2</sup></b>						
PAQ1	0.27	0.32 (0.21, 0.43)	0.20	0.24 (0.12, 0.36)	0.03	0.04 (-0.08, 0.14)
PAQ2	0.31	0.37 (0.25, 0.47)	0.24	0.29 (0.17, 0.40)	0.07	0.08 (-0.03, 0.19)
PAQ <sub>avg</sub>	0.30	0.36 (0.25, 0.47)	0.23	0.28 (0.16, 0.39)	0.06	0.07 (-0.04, 0.18)
ACT24 (2)	0.20	0.23 (0.11, 0.35)	0.13	0.15 (0.03, 0.27)	-0.03	-0.03 (-0.14, 0.09)
ACT24 <sub>avg</sub>	0.31	0.35 (0.23, 0.46)	0.26	0.31 (0.19, 0.42)	0.11	0.11 (0.00, 0.22)
<b>Vigorous activity (MET-hrs/day)</b>						
<b>BMI &lt;25 kg/m<sup>2</sup></b>						
PAQ1	0.20	0.25 (0.11, 0.38)	0.19	0.24 (0.10, 0.38)	0.15	0.18 (0.04, 0.31)
PAQ2	0.22	0.28 (0.13, 0.41)	0.22	0.27 (0.12, 0.41)	0.17	0.21 (0.07, 0.34)
PAQ <sub>avg</sub>	0.20	0.26 (0.11, 0.39)	0.20	0.25 (0.10, 0.39)	0.16	0.19 (0.06, 0.33)
ACT24 (2)	0.05	0.07 (-0.09, 0.21)	0.11	0.14 (-0.02, 0.29)	0.15	0.18 (0.03, 0.32)
ACT24 <sub>avg</sub>	0.18	0.21 (0.07, 0.35)	0.21	0.24 (0.09, 0.38)	0.20	0.23 (0.09, 0.37)

	DLW-PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>BMI ≥25 kg/m<sup>2</sup></b>						
PAQ1	0.16	0.20 (0.08, 0.31)	0.12	0.15 (0.03, 0.27)	0.03	0.03 (-0.09, 0.14)
PAQ2	0.18	0.21 (0.10, 0.33)	0.13	0.15 (0.03, 0.27)	0.00	0.00 (-0.11, 0.11)
PAQ <sub>avg</sub>	0.18	0.21 (0.10, 0.33)	0.14	0.16 (0.05, 0.28)	0.03	0.03 (-0.08, 0.14)
ACT24 (2)	0.05	0.05 (-0.07, 0.17)	0.03	0.03 (-0.09, 0.15)	-0.04	-0.04 (-0.15, 0.08)
ACT24 <sub>avg</sub>	0.11	0.13 (0.01, 0.25)	0.06	0.08 (-0.04, 0.19)	-0.03	-0.04 (-0.14, 0.08)
<b>Moderate activity (MET-hrs/day)</b>						
<b>BMI &lt;25 kg/m<sup>2</sup></b>						
PAQ1	0.25	0.31 (0.15, 0.44)	0.27	0.34 (0.18, 0.48)	0.27	0.34 (0.2, 0.46)
PAQ2	0.24	0.28 (0.12, 0.42)	0.26	0.29 (0.13, 0.44)	0.22	0.25 (0.11, 0.38)
PAQ <sub>avg</sub>	0.26	0.31 (0.15, 0.44)	0.28	0.33 (0.16, 0.47)	0.26	0.30 (0.16, 0.43)
ACT24 (2)	0.05	0.07 (-0.08, 0.21)	0.06	0.08 (-0.08, 0.23)	0.02	0.03 (-0.11, 0.17)
ACT24 <sub>avg</sub>	0.10	0.13 (-0.01, 0.27)	0.10	0.13 (-0.02, 0.27)	0.04	0.04 (-0.09, 0.17)
<b>BMI ≥25 kg/m<sup>2</sup></b>						
PAQ1	0.23	0.28 (0.16, 0.38)	0.17	0.20 (0.09, 0.32)	0.02	0.02 (-0.10, 0.13)
PAQ2	0.26	0.31 (0.19, 0.42)	0.21	0.25 (0.13, 0.37)	0.07	0.08 (-0.03, 0.19)
PAQ <sub>avg</sub>	0.27	0.32 (0.20, 0.43)	0.21	0.25 (0.13, 0.37)	0.06	0.06 (-0.05, 0.17)
ACT24 (2)	0.16	0.19 (0.07, 0.31)	0.09	0.11 (-0.01, 0.23)	-0.06	-0.07 (-0.18, 0.05)
ACT24 <sub>avg</sub>	0.27	0.31 (0.19, 0.42)	0.23	0.27 (0.15, 0.38)	0.09	0.10 (-0.01, 0.21)
<b>Sedentary time (hrs/day)</b>						
<b>BMI &lt;25 kg/m<sup>2</sup></b>						
PAQ1	-0.12	-0.13 (-0.27, 0.01)	-0.09	-0.11 (-0.25, 0.03)	-0.04	-0.06 (-0.19, 0.08)
PAQ2	-0.10	-0.13 (-0.26, 0.01)	-0.10	-0.13 (-0.27, 0.01)	-0.08	-0.10 (-0.23, 0.04)
PAQ <sub>avg</sub>	-0.13	-0.14 (-0.28, 0.00)	-0.11	-0.14 (-0.28, 0.00)	-0.07	-0.09 (-0.23, 0.04)
ACT24 (2)	-0.09	-0.12 (-0.276, 0.03)	-0.10	-0.12 (-0.27, 0.03)	-0.09	-0.12 (-0.26, 0.03)
ACT24 <sub>avg</sub>	-0.12	-0.15 (-0.29, -0.01)	-0.13	-0.17 (-0.31, -0.03)	-0.11	-0.14 (-0.27, -0.01)
<b>BMI ≥25 kg/m<sup>2</sup></b>						
PAQ1	0.00	0.00 (-0.11, 0.12)	0.02	0.03 (-0.09, 0.15)	0.05	0.05 (-0.06, 0.16)
PAQ2	0.05	0.06 (-0.06, 0.17)	0.07	0.08 (-0.04, 0.20)	0.07	0.07 (-0.04, 0.18)
PAQ <sub>avg</sub>	0.04	0.05 (-0.07, 0.16)	0.07	0.08 (-0.04, 0.20)	0.08	0.08 (-0.03, 0.19)
ACT24 (2)	-0.12	-0.13 (-0.25, -0.01)	-0.07	-0.08 (-0.20, 0.05)	0.02	0.03 (-0.09, 0.14)
ACT24 <sub>avg</sub>	-0.11	-0.13 (-0.25, -0.01)	-0.09	-0.10 (-0.22, 0.02)	-0.01	-0.01 (-0.12, 0.10)

DLW: Doubly-labeled Water; PAL: Physical Activity Level; TEE: Total Daily Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; ACT24: Activities Completed Over Time in 24 hours; ACT24 (2): ACT24 collected in Phase 2; MVPA: moderate to vigorous intensity physical activity.

**Web Table 8: Age adjusted and deattenuated Spearman Correlation Coefficients comparing physical activity questionnaire and 24 hours recalls to doubly-labeled water determined physical activity level (PAL), physical activity energy expenditure (PAEE), and total energy expenditure (TEE) among participants of Women's Lifestyle Validation Study by Age ( $\leq 60$ ,  $> 60$  years), 2010-2012.**

	<b>DLW-PAL</b>		<b>DLW-determined PAEE</b>		<b>DLW-determined TEE</b>	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>						
<b><math>\leq 60</math> years</b>						
PAQ1	0.31	0.41 (0.24, 0.55)	0.21	0.27 (0.11, 0.41)	0.00	0.00 (-0.12, 0.12)
PAQ2	0.30	0.30 (0.11, 0.47)	0.18	0.22 (0.06, 0.37)	-0.02	-0.01 (-0.13, 0.11)
PAQ <sub>avg</sub>	0.33	0.38 (0.19, 0.54)	0.22	0.26 (0.10, 0.41)	-0.01	-0.01 (-0.12, 0.11)
ACT24 (2)	0.14	0.19 (0.03, 0.35)	0.07	0.09 (-0.07, 0.24)	-0.09	-0.10 (-0.23, 0.03)
ACT24 <sub>avg</sub>	0.25	0.33 (0.16, 0.47)	0.16	0.22 (0.07, 0.36)	-0.03	-0.04 (-0.15, 0.09)
<b><math>&gt; 60</math> years</b>						
PAQ1	0.33	0.37 (0.27, 0.47)	0.29	0.34 (0.22, 0.44)	0.17	0.16 (0.05, 0.28)
PAQ2	0.38	0.43 (0.33, 0.53)	0.34	0.40 (0.29, 0.50)	0.16	0.18 (0.07, 0.29)
PAQ <sub>avg</sub>	0.38	0.43 (0.33, 0.53)	0.34	0.39 (0.28, 0.50)	0.17	0.18 (0.07, 0.29)
ACT24 (2)	0.32	0.35 (0.24, 0.46)	0.27	0.31 (0.19, 0.42)	0.13	0.13 (0.01, 0.24)
ACT24 <sub>avg</sub>	0.39	0.44 (0.34, 0.54)	0.34	0.40 (0.29, 0.50)	0.16	0.18 (0.07, 0.29)
<b>MVPA (MET-hrs/day)</b>						
<b><math>\leq 60</math> years</b>						
PAQ1	0.28	0.37 (0.20, 0.51)	0.15	0.19 (0.04, 0.34)	-0.09	-0.07 (-0.19, 0.05)
PAQ2	0.29	0.34 (0.16, 0.50)	0.16	0.20 (0.04, 0.35)	-0.07	-0.04 (-0.16, 0.08)
PAQ <sub>avg</sub>	0.30	0.38 (0.20, 0.53)	0.17	0.21 (0.05, 0.36)	-0.09	-0.05 (-0.17, 0.07)
ACT24 (2)	0.11	0.15 (-0.01, 0.3)	0.05	0.06 (-0.09, 0.21)	-0.08	-0.10 (-0.22, 0.03)
ACT24 <sub>avg</sub>	0.20	0.25 (0.09, 0.39)	0.13	0.17 (0.02, 0.32)	-0.02	-0.03 (-0.14, 0.10)
<b><math>&gt; 60</math> years</b>						
PAQ1	0.34	0.39 (0.28, 0.49)	0.31	0.36 (0.24, 0.46)	0.18	0.19 (0.08, 0.30)
PAQ2	0.36	0.41 (0.31, 0.51)	0.33	0.39 (0.27, 0.49)	0.17	0.20 (0.09, 0.31)
PAQ <sub>avg</sub>	0.36	0.42 (0.31, 0.51)	0.33	0.38 (0.27, 0.49)	0.17	0.19 (0.08, 0.30)
ACT24 (2)	0.25	0.27 (0.15, 0.37)	0.19	0.21 (0.09, 0.33)	0.03	0.04 (-0.09, 0.15)
ACT24 <sub>avg</sub>	0.31	0.35 (0.24, 0.45)	0.26	0.31 (0.19, 0.42)	0.10	0.11 (0.00, 0.23)
<b>Vigorous activity (MET-hrs/day)</b>						
<b><math>\leq 60</math> years</b>						
PAQ1	0.23	0.30 (0.13, 0.44)	0.10	0.13 (-0.02, 0.28)	-0.08	-0.09 (-0.21, 0.03)
PAQ2	0.21	0.24 (0.07, 0.40)	0.06	0.14 (-0.02, 0.29)	-0.10	-0.07 (-0.18, 0.06)
PAQ <sub>avg</sub>	0.24	0.28 (0.11, 0.43)	0.11	0.15 (-0.01, 0.30)	-0.06	-0.06 (-0.17, 0.07)
ACT24 (2)	0.06	0.09 (-0.07, 0.24)	0.07	0.09 (-0.07, 0.24)	0.04	0.05 (-0.08, 0.18)
ACT24 <sub>avg</sub>	0.16	0.20 (0.05, 0.35)	0.13	0.17 (0.02, 0.32)	0.06	0.07 (-0.05, 0.19)
<b><math>&gt; 60</math> years</b>						

	<b>DLW-PAL</b>		<b>DLW-determined PAEE</b>		<b>DLW-determined TEE</b>	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
PAQ1	0.19	0.21 (0.10, 0.32)	0.16	0.19 (0.07, 0.30)	0.07	0.08 (-0.03, 0.19)
PAQ2	0.21	0.24 (0.12, 0.35)	0.19	0.23 (0.11, 0.35)	0.11	0.12 (0.01, 0.24)
PAQ <sub>avg</sub>	0.19	0.21 (0.10, 0.32)	0.17	0.20 (0.08, 0.32)	0.09	0.10 (-0.02, 0.21)
ACT24 (2)	0.11	0.12 (0.00, 0.24)	0.10	0.11 (-0.01, 0.23)	0.05	0.06 (-0.06, 0.18)
ACT24 <sub>avg</sub>	0.18	0.20 (0.09, 0.31)	0.15	0.17 (0.06, 0.29)	0.06	0.07 (-0.04, 0.18)
<b>Moderate activity (MET-hrs/day)</b>						
<b>≤ 60 years</b>						
PAQ1	0.23	0.30 (0.13, 0.44)	0.14	0.17 (0.02, 0.32)	-0.05	-0.02 (-0.14, 0.10)
PAQ2	0.23	0.30 (0.13, 0.44)	0.14	0.17 (0.02, 0.32)	-0.04	-0.03 (-0.15, 0.09)
PAQ <sub>avg</sub>	0.24	0.32 (0.16, 0.47)	0.15	0.18 (0.03, 0.33)	-0.05	-0.03 (-0.15, 0.10)
ACT24 (2)	0.07	0.10 (-0.05, 0.25)	0.02	0.03 (-0.12, 0.17)	-0.10	-0.11 (-0.24, 0.02)
ACT24 <sub>avg</sub>	0.12	0.16 (0.01, 0.30)	0.07	0.09 (-0.05, 0.23)	-0.05	-0.06 (-0.18, 0.06)
<b>&gt; 60 years</b>						
PAQ1	0.30	0.34 (0.23, 0.44)	0.25	0.30 (0.18, 0.40)	0.12	0.13 (0.01, 0.24)
PAQ2	0.32	0.36 (0.25, 0.46)	0.27	0.32 (0.20, 0.43)	0.12	0.14 (0.02, 0.25)
PAQ <sub>avg</sub>	0.33	0.38 (0.27, 0.48)	0.28	0.33 (0.22, 0.44)	0.12	0.14 (0.03, 0.25)
ACT24 (2)	0.20	0.22 (0.10, 0.33)	0.14	0.15 (0.03, 0.27)	-0.03	-0.03 (-0.15, 0.09)
ACT24 <sub>avg</sub>	0.29	0.33 (0.22, 0.43)	0.24	0.28 (0.16, 0.39)	0.07	0.08 (-0.03, 0.19)
<b>Sedentary time (hrs/day)</b>						
<b>≤ 60 years</b>						
PAQ1	-0.06	-0.09 (-0.23, 0.06)	0.00	0.00 (-0.13, 0.14)	0.07	0.08 (-0.04, 0.20)
PAQ2	-0.05	-0.07 (-0.21, 0.07)	-0.03	-0.04 (-0.18, 0.11)	0.00	-0.01 (-0.12, 0.11)
PAQ <sub>avg</sub>	-0.05	-0.07 (-0.21, 0.08)	-0.01	-0.01 (-0.15, 0.13)	0.04	0.04 (-0.08, 0.16)
ACT24 (2)	-0.14	-0.19 (-0.35, -0.03)	-0.10	-0.13 (-0.29, 0.03)	0.00	0.00 (-0.12, 0.13)
ACT24 <sub>avg</sub>	-0.14	-0.19 (-0.34, -0.04)	-0.13	-0.17 (-0.31, -0.02)	-0.04	-0.04 (-0.16, 0.08)
<b>&gt; 60 years</b>						
PAQ1	-0.03	-0.03 (-0.14, 0.09)	-0.05	-0.05 (-0.17, 0.07)	-0.06	-0.07 (-0.18, 0.05)
PAQ2	0.02	0.02 (-0.1, 0.13)	0.01	0.01 (-0.11, 0.12)	-0.01	-0.02 (-0.12, 0.10)
PAQ <sub>avg</sub>	-0.01	-0.01 (-0.12, 0.11)	-0.02	-0.03 (-0.14, 0.10)	-0.04	-0.04 (-0.16, 0.07)
ACT24 (2)	-0.08	-0.09 (-0.21, 0.03)	-0.05	-0.06 (-0.18, 0.07)	0.00	0.00 (-0.12, 0.11)
ACT24 <sub>avg</sub>	-0.10	-0.12 (-0.23, 0.00)	-0.06	-0.07 (-0.19, 0.05)	0.01	0.01 (-0.11, 0.12)

DLW: Doubly-labeled Water; PAL: Physical Activity Level; TEE: Total Daily Energy Expenditure; PAEE: Physical Activity Energy Expenditure; PAQ: Physical Activity Questionnaire; ACT24: Activities Completed Over Time in 24 hours; ACT24 (2): ACT24 collected in Phase 2; MVPA: moderate to vigorous intensity physical activity.

**Web Table 9: Age adjusted and deattenuated Spearman Correlation Coefficients comparing physical activity questionnaire, 24 hours recalls, and resting metabolic rate to doubly-labeled water determined physical activity level (PAL), physical activity expenditure (PAEE), and total energy expenditure (TEE) among participants of Women's Lifestyle Validation Study by cohort type (NHS, NHS2), 2010-2012.**

	DLW-PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>						
<b>NHS</b>						
PAQ1	0.35	0.39 (0.27, 0.50)	0.32	0.36 (0.23, 0.48)	0.20	0.19 (0.07, 0.32)
PAQ2	0.37	0.43 (0.31, 0.53)	0.34	0.41 (0.28, 0.52)	0.19	0.21 (0.09, 0.33)
PAQ <sub>avg</sub>	0.39	0.44 (0.32, 0.54)	0.36	0.41 (0.28, 0.53)	0.20	0.21 (0.09, 0.34)
ACT24 (2)	0.34	0.37 (0.25, 0.49)	0.31	0.34 (0.2, 0.46)	0.16	0.16 (0.03, 0.29)
ACT24 <sub>avg</sub>	0.38	0.44 (0.32, 0.54)	0.35	0.42 (0.29, 0.53)	0.22	0.23 (0.11, 0.35)
<b>NHS2</b>						
PAQ1	0.31	0.38 (0.24, 0.50)	0.21	0.26 (0.12, 0.38)	0.00	0.00 (-0.11, 0.11)
PAQ2	0.32	0.34 (0.19, 0.48)	0.21	0.24 (0.11, 0.37)	-0.01	0.00 (-0.11, 0.11)
PAQ <sub>avg</sub>	0.34	0.39 (0.24, 0.52)	0.23	0.27 (0.12, 0.39)	-0.01	0.00 (-0.11, 0.11)
ACT24 (2)	0.15	0.19 (0.06, 0.33)	0.08	0.10 (-0.04, 0.23)	-0.08	-0.09 (-0.20, 0.02)
ACT24 <sub>avg</sub>	0.28	0.35 (0.21, 0.47)	0.18	0.23 (0.10, 0.36)	-0.03	-0.04 (-0.14, 0.08)
<b>MVPA (MET-hrs/day)</b>						
<b>NHS</b>						
PAQ1	0.36	0.41 (0.29, 0.51)	0.35	0.40 (0.27, 0.52)	0.24	0.25 (0.12, 0.37)
PAQ2	0.37	0.43 (0.31, 0.53)	0.35	0.43 (0.30, 0.54)	0.23	0.27 (0.14, 0.38)
PAQ <sub>avg</sub>	0.38	0.43 (0.32, 0.54)	0.36	0.43 (0.30, 0.54)	0.23	0.27 (0.14, 0.38)
ACT24 (2)	0.28	0.31 (0.18, 0.42)	0.24	0.26 (0.12, 0.39)	0.09	0.09 (-0.05, 0.22)
ACT24 <sub>avg</sub>	0.31	0.36 (0.24, 0.47)	0.28	0.34 (0.20, 0.46)	0.14	0.16 (0.04, 0.29)
<b>NHS2</b>						
PAQ1	0.28	0.35 (0.21, 0.47)	0.15	0.18 (0.05, 0.31)	-0.07	-0.07 (-0.18, 0.04)
PAQ2	0.30	0.35 (0.21, 0.48)	0.17	0.20 (0.07, 0.33)	-0.07	-0.05 (-0.16, 0.06)
PAQ <sub>avg</sub>	0.31	0.37 (0.23, 0.49)	0.17	0.20 (0.07, 0.33)	-0.08	-0.06 (-0.17, 0.05)
ACT24 (2)	0.10	0.13 (-0.01, 0.26)	0.03	0.04 (-0.09, 0.17)	-0.09	-0.10 (-0.21, 0.01)
ACT24 <sub>avg</sub>	0.21	0.25 (0.11, 0.37)	0.14	0.17 (0.04, 0.29)	-0.03	-0.04 (-0.14, 0.08)
<b>Vigorous activity (MET-hrs/day)</b>						
<b>NHS</b>						
PAQ1	0.21	0.23 (0.11, 0.35)	0.19	0.22 (0.09, 0.35)	0.11	0.13 (0.00, 0.25)
PAQ2	0.21	0.24 (0.11, 0.36)	0.21	0.25 (0.11, 0.37)	0.14	0.17 (0.04, 0.29)
PAQ <sub>avg</sub>	0.20	0.22 (0.10, 0.35)	0.19	0.23 (0.10, 0.36)	0.12	0.14 (0.02, 0.27)
ACT24 (2)	0.12	0.14 (0.01, 0.27)	0.13	0.15 (0.01, 0.29)	0.11	0.12 (-0.02, 0.25)

ACT24 <sub>avg</sub>	DLW-PAL		DLW-determined PAEE		DLW-determined TEE	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
ACT24 <sub>avg</sub>	0.18	0.21 (0.09, 0.33)	0.17	0.20 (0.07, 0.33)	0.10	0.12 (-0.01, 0.24)
<b>NHS2</b>						
PAQ1	0.20	0.25 (0.11, 0.37)	0.08	0.10 (-0.03, 0.23)	-0.08	-0.10 (-0.20, 0.01)
PAQ2	0.22	0.25 (0.11, 0.38)	0.10	0.13 (0.00, 0.26)	-0.07	-0.06 (-0.17, 0.05)
PAQ <sub>avg</sub>	0.22	0.26 (0.12, 0.38)	0.10	0.13 (0.00, 0.26)	-0.06	-0.06 (-0.17, 0.05)
ACT24 (2)	0.05	0.06 (-0.08, 0.19)	0.05	0.06 (-0.07, 0.19)	0.02	0.03 (-0.09, 0.14)
ACT24 <sub>avg</sub>	0.14	0.18 (0.05, 0.31)	0.12	0.14 (0.02, 0.27)	0.05	0.05 (-0.06, 0.16)
<b>Moderate activity (MET-hrs/day)</b>						
<b>NHS</b>						
PAQ1	0.29	0.34 (0.22, 0.45)	0.26	0.32 (0.18, 0.44)	0.17	0.18 (0.05, 0.30)
PAQ2	0.31	0.36 (0.24, 0.47)	0.29	0.34 (0.21, 0.46)	0.16	0.19 (0.06, 0.31)
PAQ <sub>avg</sub>	0.33	0.38 (0.26, 0.49)	0.30	0.36 (0.23, 0.48)	0.17	0.19 (0.07, 0.32)
ACT24 (2)	0.22	0.24 (0.11, 0.37)	0.17	0.18 (0.04, 0.31)	0.01	0.00 (-0.13, 0.13)
ACT24 <sub>avg</sub>	0.28	0.33 (0.2, 0.44)	0.25	0.30 (0.16, 0.42)	0.11	0.12 (-0.01, 0.25)
<b>NHS2</b>						
PAQ1	0.24	0.30 (0.16, 0.42)	0.14	0.17 (0.05, 0.30)	-0.04	-0.04 (-0.14, 0.07)
PAQ2	0.24	0.31 (0.17, 0.43)	0.15	0.18 (0.05, 0.31)	-0.05	-0.04 (-0.15, 0.07)
PAQ <sub>avg</sub>	0.26	0.33 (0.19, 0.45)	0.15	0.19 (0.06, 0.32)	-0.05	-0.04 (-0.15, 0.07)
ACT24 (2)	0.07	0.10 (-0.04, 0.23)	0.02	0.02 (-0.11, 0.15)	-0.10	-0.11 (-0.22, 0.01)
ACT24 <sub>avg</sub>	0.14	0.18 (0.05, 0.30)	0.09	0.11 (-0.02, 0.23)	-0.05	-0.06 (-0.16, 0.05)
<b>Sedentary time (hrs/day)</b>						
<b>NHS</b>						
PAQ1	-0.02	-0.03 (-0.15, 0.11)	-0.05	-0.06 (-0.19, 0.08)	-0.07	-0.08 (-0.20, 0.05)
PAQ2	0.04	0.04 (-0.09, 0.17)	0.01	0.01 (-0.12, 0.14)	-0.05	-0.06 (-0.18, 0.08)
PAQ <sub>avg</sub>	0.01	0.01 (-0.12, 0.13)	-0.02	-0.03 (-0.16, 0.11)	-0.07	-0.08 (-0.20, 0.05)
ACT24 (2)	-0.09	-0.10 (-0.23, 0.03)	-0.06	-0.07 (-0.20, 0.08)	-0.01	-0.01 (-0.14, 0.12)
ACT24 <sub>avg</sub>	-0.08	-0.09 (-0.22, 0.04)	-0.05	-0.05 (-0.18, 0.08)	0.00	0.00 (-0.12, 0.13)
<b>NHS2</b>						
PAQ1	-0.06	-0.09 (-0.21, 0.04)	-0.01	-0.01 (-0.13, 0.11)	0.06	0.07 (-0.04, 0.17)
PAQ2	-0.06	-0.07 (-0.20, 0.05)	-0.02	-0.03 (-0.15, 0.10)	0.02	0.02 (-0.10, 0.12)
PAQ <sub>avg</sub>	-0.05	-0.07 (-0.19, 0.06)	-0.01	-0.01 (-0.13, 0.11)	0.04	0.05 (-0.07, 0.15)
ACT24 (2)	-0.13	-0.17 (-0.30, -0.03)	-0.09	-0.11 (-0.24, 0.03)	0.01	0.01 (-0.11, 0.12)
ACT24 <sub>avg</sub>	-0.15	-0.19 (-0.32, -0.06)	-0.13	-0.16 (-0.29, -0.03)	-0.03	-0.04 (-0.14, 0.08)



**Web Table 10: Age-adjusted and deattenuated Spearman correlation coefficients (95% confidence interval) comparing physical activity questionnaire and 24-hour recalls to accelerometer measured activity in the Women's Lifestyle Validation Study, 2010-2012, by body mass index (BMI), age, and cohort type.**

Accelerometer*												
	BMI				Age				Cohort			
	< 25 (N=322)		≥ 25 (N=361)		≤60 (N=335)		>60 (N=348)		NHS (N=292)		NHS2 (N=391)	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total physical activity (MET-hrs/day)</b>												
PAQ1	0.38	0.42 (0.32, 0.51)	0.35	0.38 (0.28, 0.47)	0.38	0.41 (0.31, 0.50)	0.41	0.44 (0.34, 0.52)	0.40	0.43 (0.32, 0.52)	0.39	0.42 (0.33, 0.51)
PAQ2	0.36	0.39 (0.29, 0.49)	0.38	0.41 (0.31, 0.49)	0.43	0.47 (0.37, 0.55)	0.37	0.40 (0.30, 0.48)	0.34	0.36 (0.25, 0.46)	0.45	0.48 (0.39, 0.56)
PAQ <sub>avg</sub>	0.40	0.44 (0.34, 0.53)	0.39	0.42 (0.33, 0.51)	0.44	0.48 (0.37, 0.56)	0.42	0.45 (0.36, 0.53)	0.40	0.42 (0.32, 0.52)	0.45	0.49 (0.40, 0.57)
ACT24 (2)	0.28	0.31 (0.19, 0.41)	0.27	0.28 (0.17, 0.38)	0.27	0.30 (0.18, 0.40)	0.37	0.34 (0.24, 0.44)	0.36	0.34 (0.22, 0.45)	0.28	0.30 (0.2, 0.39)
ACT24 <sub>avg</sub>	0.3	0.34 (0.23, 0.43)	0.37	0.40 (0.31, 0.49)	0.36	0.40 (0.3, 0.49)	0.42	0.42 (0.32, 0.50)	0.74	0.40 (0.30, 0.50)	0.37	0.40 (0.31, 0.49)
<b>MVPA (MET-hrs/day)</b>												
PAQ1	0.37	0.41 (0.31, 0.50)	0.35	0.38 (0.28, 0.47)	0.41	0.45 (0.35, 0.54)	0.38	0.41 (0.31, 0.50)	0.44	0.40 (0.30, 0.50)	0.41	0.44 (0.35, 0.52)
PAQ2	0.39	0.42 (0.32, 0.51)	0.34	0.37 (0.27, 0.46)	0.47	0.52 (0.42, 0.60)	0.36	0.35 (0.25, 0.44)	0.31	0.32 (0.20, 0.42)	0.47	0.51 (0.42, 0.59)
PAQ <sub>avg</sub>	0.40	0.44 (0.34, 0.53)	0.37	0.40 (0.31, 0.49)	0.47	0.52 (0.42, 0.60)	0.39	0.41 (0.31, 0.50)	0.39	0.39 (0.28, 0.49)	0.47	0.51 (0.42, 0.58)
ACT24 (2)	0.36	0.31 (0.20, 0.42)	0.16	0.17 (0.06, 0.28)	0.15	0.17 (0.06, 0.28)	0.31	0.31 (0.20, 0.41)	0.30	0.31 (0.19, 0.42)	0.18	0.19 (0.09, 0.30)
ACT24 <sub>avg</sub>	0.32	0.35 (0.24, 0.44)	0.28	0.31 (0.20, 0.40)	0.27	0.29 (0.18, 0.39)	0.44	0.38 (0.28, 0.47)	0.33	0.34 (0.22, 0.44)	0.31	0.34 (0.24, 0.42)
<b>Vigorous activity (MET-hrs/day)</b>												
PAQ1	0.38	0.43 (0.32, 0.52)	0.29	0.37 (0.25, 0.48)	0.46	0.54 (0.43, 0.64)	0.24	0.26 (0.15, 0.37)	0.22	0.24 (0.11, 0.37)	0.44	0.52 (0.41, 0.61)
PAQ2	0.37	0.42 (0.32, 0.52)	0.32	0.38 (0.26, 0.49)	0.45	0.54 (0.43, 0.63)	0.26	0.26 (0.14, 0.37)	0.24	0.25 (0.11, 0.37)	0.44	0.52 (0.41, 0.61)
PAQ <sub>avg</sub>	0.41	0.46 (0.36, 0.55)	0.33	0.41 (0.29, 0.52)	0.50	0.59 (0.48, 0.68)	0.27	0.28 (0.16, 0.38)	0.24	0.25 (0.12, 0.37)	0.49	0.58 (0.48, 0.66)
ACT24 (2)	0.19	0.21	0.19	0.25	0.23	0.28	0.08	0.10	0.13	0.12	0.23	0.27

Accelerometer*												
	BMI				Age				Cohort			
	< 25 (N=322)		≥ 25 (N=361)		≤60 (N=335)		>60 (N=348)		NHS (N=292)		NHS2 (N=391)	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
		(0.10, 0.33)		(0.11, 0.37)		(0.15, 0.39)		(-0.02, 0.22)		(-0.02, 0.25)		(0.16, 0.38)
ACT24 <sub>avg</sub>	0.29	0.31 (0.19, 0.41)	0.25	0.31 (0.19, 0.43)	0.32	0.38 (0.26, 0.48)	0.18	0.15 (0.03, 0.26)	0.16	0.14 (0.01, 0.27)	0.31	0.37 (0.26, 0.46)
<b>Moderate activity (MET-hrs/day)</b>												
PAQ1	0.33	0.36 (0.25, 0.46)	0.32	0.34 (0.24, 0.43)	0.34	0.38 (0.27, 0.47)	0.36	0.39 (0.29, 0.47)	0.46	0.40 (0.29, 0.49)	0.33	0.36 (0.27, 0.45)
PAQ2	0.35	0.38 (0.28, 0.48)	0.30	0.32 (0.22, 0.41)	0.37	0.41 (0.31, 0.50)	0.35	0.36 (0.26, 0.45)	0.32	0.33 (0.21, 0.43)	0.39	0.43 (0.34, 0.51)
PAQ <sub>avg</sub>	0.36	0.40 (0.30, 0.50)	0.33	0.36 (0.26, 0.45)	0.38	0.43 (0.33, 0.52)	0.38	0.40 (0.31, 0.49)	0.41	0.39 (0.28, 0.49)	0.39	0.43 (0.34, 0.51)
ACT24 (2)	0.72	0.23 (0.11, 0.34)	0.13	0.14 (0.03, 0.25)	0.04	0.05 (-0.07, 0.16)	0.33	0.33 (0.22, 0.43)	0.30	0.32 (0.2, 0.43)	0.09	0.10 (0.00, 0.21)
ACT24 <sub>avg</sub>	0.27	0.28 (0.16, 0.38)	0.25	0.27 (0.16, 0.37)	0.17	0.18 (0.08, 0.30)	0.41	0.35 (0.25, 0.45)	0.30	0.31 (0.19, 0.41)	0.23	0.25 (0.15, 0.36)
<b>Sedentary time (hrs/day)</b>												
PAQ1	0.09	0.08 (-0.04, 0.19)	0.06	0.07 (-0.05, 0.18)	0.17	0.18 (0.07, 0.30)	-0.01	-0.02 (-0.12, 0.10)	-0.02	-0.02 (-0.14, 0.10)	0.14	0.16 (0.05, 0.26)
PAQ2	0.21	0.20 (0.09, 0.31)	0.08	0.09 (-0.02, 0.20)	0.20	0.22 (0.11, 0.34)	0.03	0.03 (-0.08, 0.14)	0.02	0.02 (-0.1, 0.14)	0.18	0.20 (0.10, 0.31)
PAQ <sub>avg</sub>	0.17	0.17 (0.05, 0.28)	0.08	0.09 (-0.02, 0.20)	0.21	0.23 (0.11, 0.35)	0.02	0.01 (-0.10, 0.12)	0.00	0.0 (-0.12, 0.11)	0.19	0.21 (0.11, 0.31)
ACT24 (2)	0.18	0.20 (0.08, 0.31)	0.26	0.27 (0.15, 0.37)	0.27	0.30 (0.18, 0.40)	0.19	0.20 (0.09, 0.31)	0.19	0.20 (0.08, 0.33)	0.26	0.29 (0.18, 0.38)
ACT24 <sub>avg</sub>	0.24	0.26 (0.14, 0.37)	0.24	0.26 (0.15, 0.37)	0.29	0.32 (0.21, 0.42)	0.22	0.23 (0.11, 0.34)	0.22	0.23 (0.11, 0.35)	0.28	0.31 (0.20, 0.40)

PAQ: Physical Activity Questionnaire; MVPA: Moderate to vigorous intensity physical activity; ACT24: Activities Completed Over Time in 24 hours; ACT-24 (2): ACT24 collected in phase 2; \*Accelerometer measurements were further adjusted for wear time;

**Web Table 11: Age adjusted and deattenuated Spearman correlation coefficients (95% confidence intervals) comparing all 24 hours recall forms (ACT24) to accelerometer and resting pulse rate (RPR) measurements in Women's Lifestyle Validation Study (N=683), 2010-2012.**

	Accelerometer		RPR	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>				
ACT24 (1)	0.29	0.31 (0.24, 0.38)	-0.11	-0.12 (-0.21, -0.03)
ACT24 (2)	0.31	0.32 (0.24, 0.39)	-0.24	-0.16 (-0.25, -0.06)
ACT24 (3)	0.27	0.29 (0.20, 0.37)	-0.12	-0.13 (-0.23, -0.02)
ACT24 (4)	0.29	0.26 (0.14, 0.37)	-0.24	-0.22 (-0.37, -0.08)
ACT24 <sub>avg</sub>	0.37	0.40 (0.33, 0.46)	-0.17	-0.18 (-0.27, -0.09)
Accelerometer <sub>avg</sub>	---	---	-0.34	-0.27 (-0.36, -0.18)
<b>MVPA (MET-hrs/day)</b>				
ACT24 (1)	0.25	0.27 (0.20, 0.35)	-0.10	-0.10 (-0.19, -0.01)
ACT24 (2)	0.28	0.26 (0.18, 0.34)	-0.12	-0.12 (-0.22, -0.03)
ACT24 (3)	0.26	0.28 (0.19, 0.37)	-0.16	-0.14 (-0.24, -0.03)
ACT24 (4)	0.54	0.27 (0.15, 0.38)	-0.22	-0.22 (-0.36, -0.07)
ACT24 <sub>avg</sub>	0.32	0.35 (0.28, 0.41)	-0.11	-0.11 (-0.20, -0.02)
Accelerometer <sub>avg</sub>	---	---	-0.27	-0.25 (-0.34, -0.15)
<b>Vigorous activity (MET-hrs/day)</b>				
ACT24 (1)	0.23	0.27 (0.19, 0.36)	0.00	0.00 (-0.09, 0.10)
ACT24 (2)	0.20	0.23 (0.14, 0.32)	0.00	0.02 (-0.08, 0.11)
ACT24 (3)	0.16	0.18 (0.09, 0.28)	-0.02	-0.01 (-0.11, 0.11)
ACT24 (4)	0.24	0.27 (0.14, 0.39)	0.00	-0.02 (-0.16, 0.12)
ACT24 <sub>avg</sub>	0.27	0.31 (0.23, 0.39)	-0.07	-0.07 (-0.16, 0.02)
Accelerometer <sub>avg</sub>	---	---	-0.24	-0.26 (-0.35, -0.17)
<b>Moderate activity (MET-hrs/day)</b>				
ACT24 (1)	0.22	0.24 (0.16, 0.32)	-0.05	-0.05 (-0.14, 0.04)
ACT24 (2)	0.20	0.20 (0.12, 0.28)	-0.13	-0.14 (-0.23, -0.04)
ACT24 (3)	0.20	0.21 (0.12, 0.30)	-0.10	-0.09 (-0.19, 0.02)
ACT24 (4)	0.38	0.24 (0.12, 0.36)	-0.23	-0.23 (-0.37, -0.09)
ACT24 <sub>avg</sub>	0.27	0.29 (0.22, 0.37)	-0.06	-0.06 (-0.15, 0.03)
Accelerometer <sub>avg</sub>	---	---	-0.28	-0.21 (-0.30, -0.11)
<b>Sedentary time (hrs/day)</b>				
ACT24 (1)	0.15	0.17 (0.09, 0.24)	0.03	0.03 (-0.06, 0.12)
ACT24 (2)	0.23	0.25 (0.17, 0.33)	0.06	0.06 (-0.04, 0.16)
ACT24 (3)	0.23	0.26 (0.17, 0.35)	0.00	0.00 (-0.11, 0.11)
ACT24 (4)	0.22	0.25 (0.12, 0.37)	0.19	0.18 (0.04, 0.32)
ACT24 <sub>avg</sub>	0.25	0.28 (0.20, 0.35)	0.00	0.00 (-0.10, 0.10)
Accelerometer <sub>avg</sub>	---	---	0.06	0.07 (-0.02, 0.16)

**Web Table 12: Age-adjusted deattenuated Spearman correlation coefficients (95% confidence interval) comparing physical activity questionnaire to the average of up to four 24-hour recalls in the Women's Lifestyle Validation Study, 2010-2012, stratified by BMI, age, and cohort type.**

ACT24 recalls												
	BMI				Age				Cohort			
	< 25 (N=322)		≥ 25 (N=361)		≤60 (N=335)		>60 (N=348)		NHS (N=292)		NHS2 (N=391)	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
<b>Total activity (MET-hrs/day)</b>												
PAQ1	0.43	0.51 (0.37, 0.63)	0.51	0.60 (0.46, 0.70)	0.47	0.60 (0.46, 0.70)	0.5	0.65 (0.52, 0.74)	0.51	0.66 (0.52, 0.77)	0.46	0.58 (0.46, 0.68)
PAQ2	0.33	0.44 (0.30, 0.56)	0.69	0.65 (0.51, 0.75)	0.53	0.57 (0.43, 0.68)	0.51	0.65 (0.53, 0.75)	0.53	0.66 (0.52, 0.77)	0.52	0.56 (0.43, 0.66)
PAQ <sub>avg</sub>	0.42	0.53 (0.39, 0.65)	0.65	0.67 (0.53, 0.78)	0.54	0.63 (0.50, 0.73)	0.55	0.72 (0.59, 0.81)	0.57	0.72 (0.59, 0.82)	0.54	0.62 (0.50, 0.71)
<b>MVPA (MET-hrs/day)</b>												
PAQ1	0.35	0.46 (0.25, 0.62)	0.54	0.59 (0.43, 0.72)	0.37	0.56 (0.40, 0.69)	0.59	0.65 (0.47, 0.78)	0.54	0.64 (0.45, 0.78)	0.39	0.57 (0.42, 0.69)
PAQ2	0.28	0.45 (0.27, 0.60)	0.59	0.64 (0.48, 0.77)	0.39	0.58 (0.41, 0.70)	0.48	0.61 (0.44, 0.74)	0.46	0.60 (0.41, 0.74)	0.4	0.57 (0.42, 0.69)
PAQ <sub>avg</sub>	0.34	0.48 (0.29, 0.64)	0.69	0.65 (0.48, 0.77)	0.4	0.61 (0.44, 0.73)	0.61	0.66 (0.48, 0.79)	0.56	0.65 (0.44, 0.79)	0.42	0.61 (0.45, 0.72)
<b>Vigorous activity (MET-hrs/day)</b>												
PAQ1	0.36	0.41 (0.30, 0.51)	0.31	0.35 (0.25, 0.45)	0.38	0.46 (0.34, 0.57)	0.3	0.35 (0.23, 0.46)	0.33	0.41 (0.27, 0.52)	0.37	0.44 (0.33, 0.54)
PAQ2	0.32	0.37 (0.26, 0.48)	0.32	0.36 (0.25, 0.45)	0.43	0.51 (0.38, 0.62)	0.27	0.34 (0.22, 0.44)	0.31	0.39 (0.26, 0.50)	0.4	0.46 (0.35, 0.57)
PAQ <sub>avg</sub>	0.35	0.40 (0.29, 0.51)	0.32	0.36 (0.25, 0.45)	0.43	0.52 (0.39, 0.63)	0.29	0.35 (0.23, 0.46)	0.33	0.40 (0.27, 0.52)	0.41	0.50 (0.38, 0.60)
<b>Moderate activity (MET-hrs/day)</b>												
PAQ1	0.29	0.41 (0.10, 0.65)	0.43	0.54 (0.37, 0.67)	0.31	0.53 (0.33, 0.69)	0.48	0.57 (0.37, 0.71)	0.46	0.56 (0.34, 0.72)	0.34	0.55 (0.37, 0.69)
PAQ2	0.22	0.47 (0.21, 0.67)	0.46	0.54 (0.37, 0.68)	0.29	0.49 (0.29, 0.65)	0.44	0.61 (0.42, 0.75)	0.41	0.61 (0.38, 0.77)	0.32	0.51 (0.34, 0.66)
PAQ <sub>avg</sub>	0.28	0.50 (0.19, 0.71)	0.49	0.58 (0.40, 0.71)	0.32	0.54 (0.34, 0.69)	0.49	0.64 (0.44, 0.78)	0.45	0.61 (0.37, 0.78)	0.35	0.57 (0.38, 0.71)
<b>Sedentary time (hrs/day)</b>												

**ACT24 recalls**

	<b>BMI</b>				<b>Age</b>				<b>Cohort</b>			
	<b>&lt; 25 (N=322)</b>		<b>≥ 25 (N=361)</b>		<b>≤60 (N=335)</b>		<b>&gt;60 (N=348)</b>		<b>NHS (N=292)</b>		<b>NHS2 (N=391)</b>	
	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)	Age adjusted	Deattenuated (95% CI)
PAQ1	0.09	0.12 (-0.02, 0.26)	0.04	0.04 (-0.09, 0.16)	0.12	0.15 (0.02, 0.29)	0	0.00 (-0.12, 0.12)	-0.03	-0.04 (-0.18, 0.11)	0.13	0.16 (0.04, 0.28)
PAQ2	0.06	0.08 (-0.06, 0.22)	0.05	0.06 (-0.07, 0.18)	-0.01	0.0 (-0.13, 0.12)	0.1	0.12 (-0.01, 0.24)	0.05	0.05 (-0.09, 0.19)	0.05	0.06 (-0.06, 0.18)
PAQ <sub>avg</sub>	0.08	0.11 (-0.03, 0.25)	0.05	0.06 (-0.07, 0.18)	0.06	0.08 (-0.06, 0.21)	0.07	0.08 (-0.05, 0.20)	0.02	0.01 (-0.12, 0.15)	0.09	0.12 (0.0, 0.24)

PAQ: Physical Activity Questionnaire; MVPA: Moderate to vigorous intensity physical activity; ACT24: Activities Completed Over Time in 24 hours;

**Web Table 13: Validity coefficients (VCs) showing the correlations with the True Physical Activity (T) for total activity and activity intensity categories estimated from the final physical activity questionnaire (PAQ2), 24-hour recalls (ACT24), accelerometer, doubly-labeled water determined physical activity energy expenditures (DLW-PAEE) and their 95% confidence intervals among participants of Women's Lifestyle Validation Study (MLVS), United States, 2010-2012.**

	N	r <sub>QR</sub>	r <sub>QM</sub>	r <sub>RM</sub>	VC <sub>QT</sub> (95% CI)	VC <sub>MT</sub> (95% CI)	VC <sub>RT</sub> (95% CI)
<b>Q=PAQ2, R=Accelerometer, M=DLW-PAEE</b>							
Total Activity (MET-hrs/day)	662	0.39	0.27	0.37	0.53 (0.45, 0.63)	0.52 (0.43, 0.61)	0.72 (0.62, 0.84)
MVPA (MET-hrs/day)	662	0.37	0.27	0.28	0.59 (0.50, 0.70)	0.45 (0.37, 0.56)	0.62 (0.52, 0.74)
Vigorous (MET-hrs/day)	662	0.31	0.17	0.11	0.71 (0.52, 0.96)	0.25 (0.16, 0.37)	0.44 (0.32, 0.61)
Moderate (MET-hrs/day)	662	0.33	0.22	0.27	0.51 (0.42, 0.63)	0.43 (0.34, 0.54)	0.64 (0.53, 0.79)
<b>Q=ACT24<sub>avg</sub>, R=Accelerometer, M=DLW-PAEE</b>							
Total Activity (MET-hrs/day)	662	0.36	0.25	0.37	0.49 (0.40, 0.59)	0.51 (0.42, 0.61)	0.73 (0.63, 0.86)
MVPA (MET-hrs/day)	662	0.30	0.21	0.28	0.47 (0.38, 0.59)	0.44 (0.35, 0.55)	0.64 (0.52, 0.80)
Vigorous (MET-hrs/day)	662	0.25	0.14	0.11	0.56 (0.39, 0.79)	0.25 (0.16, 0.40)	0.44 (0.30, 0.64)
Moderate (MET-hrs/day)	662	0.25	0.16	0.27	0.38 (0.28, 0.51)	0.41 (0.31, 0.54)	0.67 (0.52, 0.86)

**Web Table 14: Validity coefficients (VCs) showing the correlations with the True Physical Activity (T) for total activity and activity intensity categories estimated from the final physical activity questionnaire (PAQ2), 24-hour recalls (ACT24), accelerometer, doubly-labeled water determined physical activity energy expenditures (DLW-PAEE, which was further adjusted for body weight) and their 95% confidence intervals among participants of Women's Lifestyle Validation Study (MLVS), United States, 2010-2012.**

	N	$r_{QR}$	$r_{QM}$	$r_{RM}$	VC <sub>QT</sub> (95% CI)	VC <sub>MT</sub> (95% CI)	VC <sub>RT</sub> (95% CI)
<b>Q=PAQ2, R=Accelerometer, M=DLW-PAEE</b>							
Total Activity (MET-hrs/day)	662	0.39	0.29	0.4	0.53 (0.46, 0.62)	0.55 (0.47, 0.64)	0.72 (0.63, 0.83)
MVPA (MET-hrs/day)	662	0.37	0.29	0.3	0.59 (0.50, 0.70)	0.48 (0.40, 0.58)	0.62 (0.52, 0.73)
Vigorous (MET-hrs/day)	662	0.31	0.19	0.12	0.69 (0.52, 0.91)	0.27 (0.19, 0.39)	0.46 (0.34, 0.61)
Moderate (MET-hrs/day)	662	0.32	0.24	0.29	0.52 (0.43, 0.63)	0.46 (0.37, 0.57)	0.64 (0.52, 0.77)
<b>Q=ACT24<sub>avg</sub>, R=Accelerometer, M=DLW-PAEE</b>							
Total Activity (MET-hrs/day)	662	0.35	0.26	0.39	0.49 (0.41, 0.59)	0.55 (0.46, 0.64)	0.73 (0.63, 0.84)
MVPA (MET-hrs/day)	662	0.29	0.21	0.29	0.47 (0.38, 0.59)	0.47 (0.38, 0.58)	0.64 (0.52, 0.78)
Vigorous (MET-hrs/day)	662	0.23	0.14	0.12	0.54 (0.39, 0.75)	0.27 (0.18, 0.42)	0.46 (0.32, 0.64)
Moderate (MET-hrs/day)	662	0.24	0.16	0.28	0.38 (0.29, 0.51)	0.44 (0.34, 0.57)	0.66 (0.52, 0.83)

**Web Table 15: Age adjusted and deattenuated Spearman Correlation Coefficients comparing accelerometer measurements to doubly-labeled water determined physical activity level (PAL) among participants of Women's Lifestyle Validation Study, 2010-2012.**

	<b>DLW-determined PAL</b>	
	Age adjusted	Deattenuated (95% CI)
<b>Total activity</b>		
Accelerometer 1	0.45	0.56 (0.47, 0.64)
Accelerometer 2	0.44	0.54 (0.43, 0.62)
Accelerometer <sub>avg</sub>	0.48	0.59 (0.50, 0.67)
<b>MVPA (MET-hrs/day)</b>		
Accelerometer 1	0.35	0.44 (0.35, 0.52)
Accelerometer 2	0.33	0.39 (0.30, 0.48)
Accelerometer <sub>avg</sub>	0.37	0.45 (0.36, 0.53)
<b>Vigorous activity (MET-hrs/day)</b>		
Accelerometer 1	0.17	0.22 (0.12, 0.31)
Accelerometer 2	0.15	0.18 (0.09, 0.27)
Accelerometer <sub>avg</sub>	0.17	0.21 (0.12, 0.30)
<b>Moderate activity (MET-hrs/day)</b>		
Accelerometer 1	0.34	0.42 (0.33, 0.50)
Accelerometer 2	0.31	0.38 (0.29, 0.47)
Accelerometer <sub>avg</sub>	0.36	0.44 (0.35, 0.52)
<b>Sedentary time (hrs/day)</b>		
Accelerometer 1	-0.35	-0.44 (-0.51, -0.35)
Accelerometer 2	-0.37	-0.46 (-0.54, -0.37)
Accelerometer <sub>avg</sub>	-0.38	-0.48 (-0.56, -0.38)



**Web Figure 1: Consort diagram showing the recruitment of participants in the Women’s Lifestyle Validation Study, United States, 2010-2012.**

