

TITLE: Sex differences in respiratory and circulatory cost during hypoxic walking: potential impact on oxygen saturation

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Supplemental Table 1. Energy expenditure (EE), pulmonary ventilation (\dot{V}_E), and heart rate (HR) at rest and each gait speed under normoxia and hypoxia in men and women. Changes in these variables (Δ) under moderate hypoxia versus normoxia are shown.

	Men			Women		
	Normoxia	Hypoxia		Normoxia	Hypoxia	
EE, Watts			Δ EE			Δ EE
Rest	111 ± 14	114 ± 14	3	89 ± 15*	91 ± 13†	2
0.67m s ⁻¹	259 ± 34	264 ± 40	5	200 ± 27*	204 ± 24†	4
0.83 m s ⁻¹	299 ± 47	306 ± 50	7	219 ± 32*	224 ± 23†	5
1.00 m s ⁻¹	332 ± 51	341 ± 52	9	244 ± 35*	251 ± 24†	7
1.17 m s ⁻¹	368 ± 63	377 ± 62	9	278 ± 37*	287 ± 29†	9
1.33 m s ⁻¹	417 ± 67	427 ± 65	10	320 ± 41*	329 ± 32†	9
1.50 m s ⁻¹	478 ± 74	489 ± 67	11	375 ± 56*	386 ± 50†	11
1.67 m s ⁻¹	545 ± 74	559 ± 67	14	443 ± 61*	455 ± 55†	12
\dot{V}_E , L min ⁻¹			$\Delta\dot{V}_E$			$\Delta\dot{V}_E$
Rest	11.7 ± 2.9	13.9 ± 4.3	2.2	9.5 ± 1.5	10.4 ± 1.6†	0.9
0.67m s ⁻¹	20.1 ± 3.6	23.3 ± 3.9	3.2	17.0 ± 2.1	19.2 ± 2.5	2.2
0.83 m s ⁻¹	22.0 ± 7.4	26.4 ± 3.8	4.4	18.6 ± 3.1	21.7 ± 2.7	3.1
1.00 m s ⁻¹	25.9 ± 6.0	30.4 ± 4.6	4.5	20.9 ± 3.3	24.1 ± 2.5	3.2
1.17 m s ⁻¹	28.0 ± 5.7	34.6 ± 6.2	6.6	23.5 ± 3.4	28.7 ± 3.9	5.2
1.33 m s ⁻¹	32.2 ± 6.1	39.7 ± 6.3	7.5	26.4 ± 3.8	34.2 ± 4.4	7.8
1.50 m s ⁻¹	36.5 ± 6.6	44.6 ± 7.4	8.1	31.8 ± 4.9	40.3 ± 5.9	8.5
1.67 m s ⁻¹	40.7 ± 7.2	55.8 ± 9.9	15.1	38.1 ± 5.1	50.0 ± 6.9	11.9
HR, bpm			Δ HR			Δ HR
Rest	84 ± 8	94 ± 9	10	82 ± 10	91 ± 10	9
0.67m s ⁻¹	89 ± 7	107 ± 10	18	93 ± 10	111 ± 11	18
0.83 m s ⁻¹	94 ± 7	115 ± 12	21	99 ± 12	119 ± 14	20
1.00 m s ⁻¹	99 ± 6	122 ± 14	23	103 ± 13	128 ± 12	25
1.17 m s ⁻¹	106 ± 6	130 ± 16	24	111 ± 13	137 ± 11	26
1.33 m s ⁻¹	113 ± 7	138 ± 15	25	118 ± 15	147 ± 9	29
1.50 m s ⁻¹	122 ± 8	147 ± 16	25	130 ± 17	157 ± 7	27
1.67 m s ⁻¹	133 ± 13	160 ± 15	27	142 ± 17	168 ± 6	26
Results of a two-way ANOVA						
	Normoxia	Hypoxia				
EE	Sex: F (1,18) = 16.71, <i>P</i> < 0.001	Sex: F (1,18) = 19.57, <i>P</i> < 0.001				
	Speed: F (7,126) = 532.67, <i>P</i> < 0.001	Speed: F (7,126) = 700.52, <i>P</i> < 0.001				
	Interaction: F (7,126) = 6.64, <i>P</i> < 0.001	Interaction: F (7,126) = 8.40, <i>P</i> < 0.001				
\dot{V}_E	Sex: F (1,18) = 4.06, <i>P</i> = 0.059	Sex: F (1,18) = 6.59, <i>P</i> = 0.019				
	Speed: F (7,126) = 297.86, <i>P</i> < 0.001	Speed: F (7,126) = 352.39, <i>P</i> < 0.001				
	Interaction: F (7,126) = 1.42, <i>P</i> = 0.202	Interaction: F (7,126) = 0.524, <i>P</i> = 0.815				
HR	Sex: F (1,18) = 1.08, <i>P</i> = 0.313	Sex: F (1,18) = 1.21, <i>P</i> = 0.286				
	Speed: F (7,126) = 271.72, <i>P</i> < 0.001	Speed: F (7,126) = 578.43, <i>P</i> < 0.001				
	Interaction: F (7,126) = 2.29, <i>P</i> = 0.032	Interaction: F (7,126) = 5.00, <i>P</i> < 0.001				

Values are mean ± standard deviation (SD). bpm; beats per minute. A two way repeated measures analysis of variance (ANOVA) was performed for a comparison between men and women within normoxia or hypoxia, respectively. * *P* < 0.05 between men and women in normoxia. † *P* < 0.05 between men and women in hypoxia.

Supplemental Table 2. Breathing frequency (*Bf*) and tidal volume (TV) at rest and each gait speed under normoxia and hypoxia in men and women.

	Normoxia		Hypoxia	
	Men	Women	Men	Women
<i>Bf</i> (frequency)				
Rest	11.2 ± 3.4	8.7 ± 1.9	12.1 ± 3.6	10.2 ± 3.0
0.67m s ⁻¹	19.2 ± 4.8	20.2 ± 2.3	18.6 ± 3.7	18.4 ± 3.4
0.83 m s ⁻¹	19.1 ± 6.8	21.4 ± 3.9	19.3 ± 4.6	21.0 ± 3.1
1.00 m s ⁻¹	19.6 ± 4.6	23.1 ± 4.2	23.5 ± 5.7	24.7 ± 4.6
1.17 m s ⁻¹	20.1 ± 5.4	25.6 ± 4.1*	24.9 ± 4.3	28.5 ± 4.6
1.33 m s ⁻¹	22.7 ± 5.5	27.6 ± 5.1	26.3 ± 3.8	32.8 ± 4.8†
1.50 m s ⁻¹	23.7 ± 6.1	31.9 ± 5.5*	30.4 ± 4.6	35.4 ± 4.5†
1.67 m s ⁻¹	26.8 ± 4.7	32.4 ± 4.7*	33.5 ± 5.0	38.1 ± 4.2†
TV (L min ⁻¹)				
Rest	1.05 ± 0.31	1.11 ± 0.28	1.17 ± 0.30	1.11 ± 0.38†
0.67m s ⁻¹	1.05 ± 0.19	0.84 ± 0.10*	1.25 ± 0.34	1.06 ± 0.23†
0.83 m s ⁻¹	1.16 ± 0.22	0.87 ± 0.13*	1.37 ± 0.28	1.06 ± 0.26†
1.00 m s ⁻¹	1.32 ± 0.27	0.91 ± 0.10*	1.30 ± 0.31	1.00 ± 0.27†
1.17 m s ⁻¹	1.41 ± 0.33	0.92 ± 0.15*	1.39 ± 0.28	1.03 ± 0.17†
1.33 m s ⁻¹	1.43 ± 0.31	0.96 ± 0.19*	1.51 ± 0.30	1.05 ± 0.14†
1.50 m s ⁻¹	1.54 ± 0.32	1.00 ± 0.19*	1.47 ± 0.30	1.15 ± 0.18†
1.67 m s ⁻¹	1.52 ± 0.25	1.18 ± 0.21*	1.67 ± 0.33	1.32 ± 0.19†
Results of a two-way ANOVA				
	Normoxia		Hypoxia	
<i>Bf</i>	Sex: F (1,18) = 4.19, <i>P</i> = 0.056		Sex: F (1,18) = 3.46, <i>P</i> = 0.079	
	Speed: F (7,126) = 87.59, <i>P</i> < 0.001		Speed: F (7,126) = 132.47, <i>P</i> < 0.001	
	Interaction: F (7,126) = 6.60, <i>P</i> < 0.001		Interaction: F (7,126) = 4.14, <i>P</i> < 0.002	
TV	Sex: F (1,18) = 19.44, <i>P</i> < 0.001		Sex: F (1,18) = 11.84, <i>P</i> = 0.003	
	Speed: F (7,126) = 11.71, <i>P</i> < 0.001		Speed: F (7,126) = 6.25, <i>P</i> < 0.001	
	Interaction: F (7,126) = 6.04, <i>P</i> < 0.001		Interaction: F (7,126) = 1.51, <i>P</i> = 0.168	

Values are mean ± SD. A two way repeated measures analysis of variance (ANOVA) was performed for a comparison between men and women within normoxia or hypoxia, respectively. * *P* < 0.05 between men and women in normoxia. † *P* < 0.05 between men and women in hypoxia.