

## Analysis of how Dual-tasking Effects Selected Gait Variables in Older Adults with a Known Relative Power

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Muscular power is a strong indicator of physical performance within an aging population. In addition, as one ages there is a greater need for attentional demands while walking. Thus, changes in gait patterns have been noted when performing a cognitive task or dual-tasking (DT). **PURPOSE:** The aim of this study was to kinematically compare differences in power groups on selected gait parameters while DT. **METHODS:** Twenty-three older adults ( $M \pm SD$  = age: 71.1 $\pm$ 4.4 yrs; height 1.71 $\pm$ 0.09 m; mass 84.6 $\pm$ 17.2 kg) volunteered to complete five sit-to-stand tasks (STST) and four walking trials (20 m). Subjects were placed into a low (LPG) or high power (HPG) group based on their relative power ( $P_R$ ). The walking trials were randomized and counter-balanced: habitual (HAB) and habitual with a cognitive task (DT).  $P_R$  was calculated from peak power as measured by a Tendo weight lifting analyzer during the STST. Selected gait variables were measured using a gait mat placed in the middle of the walkway. Data were analyzed using a 2x2 repeated measures ANOVA. **RESULTS:** There was significant difference for gait speed ( $p = .02$ ). The HPG walked faster than LPG during the HAB trial. There was not a difference between the groups during the DT. There were statistically significant differences across the gait variables measured between HAB and DT regardless of grouping ( $p < .05$ ). There was no difference in double support time (DST); however, there was a trend for the LPG to increase DST during the DT ( $p = .078$ ) and decrease step length more than the HPG ( $p = .08$ ).

Power and Gait Variables ( $M \pm SD$ )

	High Power (n = 11)		Low Power (n = 12)	
Relative Power (W/kg)	9.75 $\pm$ 1.68		6.53 $\pm$ 1.28	
Variables	HAB	DT	HAB	DT
Gait Speed (m/s)	1.35 $\pm$ 0.18* <sup>^</sup>	1.00 $\pm$ 0.23	1.17 $\pm$ 0.19*	0.99 $\pm$ 0.26
Step Frequency (steps/min)	111.83 $\pm$ 10.08 <sup>^</sup>	102.82 $\pm$ 15.44 <sup>^</sup>	109.00 $\pm$ 5.92 <sup>^</sup>	96.92 $\pm$ 19.58 <sup>^</sup>
Double Support Time (s)	0.29 $\pm$ 0.09 <sup>^</sup>	0.34 $\pm$ 0.09 <sup>^</sup>	0.29 $\pm$ 0.10 <sup>^</sup>	0.42 $\pm$ 0.13 <sup>^</sup>
Step Length (m)	0.72 $\pm$ 0.11 <sup>^</sup>	0.68 $\pm$ 0.10 <sup>^</sup>	0.65 $\pm$ 0.08 <sup>^</sup>	0.6 $\pm$ 0.12 <sup>^</sup>

Note: \* Significant Difference between Groups ^ Significant Difference between Conditions ( $p < .05$ )

**CONCLUSION:** This study showed DT does influence selected gait parameters in older adults. In addition, power did not have a profound effect on the gait variables even though there was a significant difference in  $P_R$  between the groups.