

**Supporting Information**  
**Two independent contributions to step variability during over-ground human walking**  
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**Table S4** Results from parameter study on the filter to separate short- and long-term components. Step variabilities of Table S2 (variance) and Table S3 (RMS variability) are recomputed here with filter cut-off period of 10 steps (rather than 30 steps). The choice of filter causes minor differences in tabulated results, but statistically significant findings remain unchanged: The correlation between speed-related and long-term step lengths remained significant with  $R^2 = 0.78$  ( $P = 0.0005$ ), and the correlation for step widths remained insignificant with  $R^2 = 0.03$  ( $P = 0.14$ )

Parameter (10-step cut-off)	units	Eyes Open condition	Eyes Closed condition
<b>Variance</b>			
Short-term			
Step length	$L^2$	$0.000120 \pm 0.000047$	$0.000202 \pm 0.000070$
Step width	$L^2$	$0.000483 \pm 0.000172$	$0.001063 \pm 0.000380$
Long-term			
Step length	$L^2$	$0.000159 \pm 0.000097$	$0.000156 \pm 0.000058$
Step width	$L^2$	$0.000163 \pm 0.000055$	$0.000262 \pm 0.000097$
<b>RMS Variability</b>			
Short-term			
Step length	m	$0.0103 \pm 0.0019$	$0.0134 \pm 0.0022$
Step width	m	$0.0207 \pm 0.0036$	$0.0307 \pm 0.0054$
Long-term			
Step length	m	$0.0116 \pm 0.0035$	$0.0117 \pm 0.0022$
Step width	m	$0.0120 \pm 0.0020$	$0.0152 \pm 0.0029$