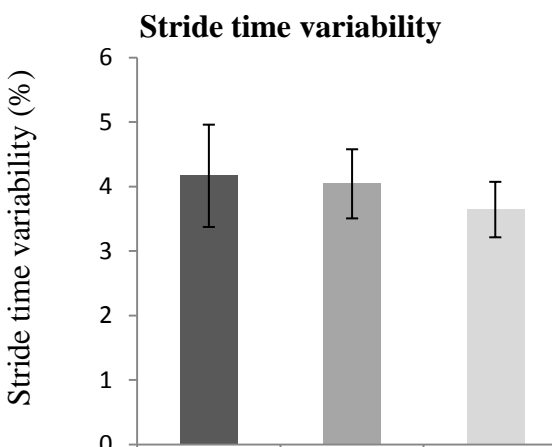
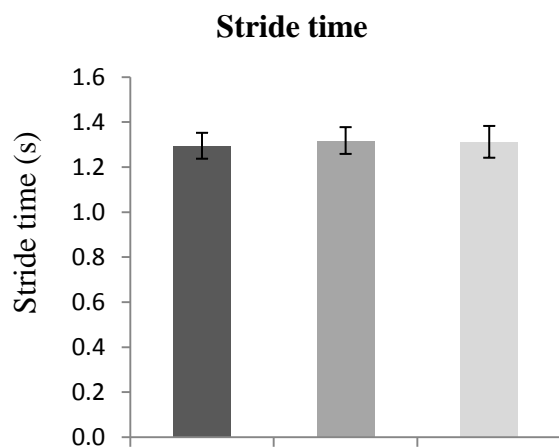
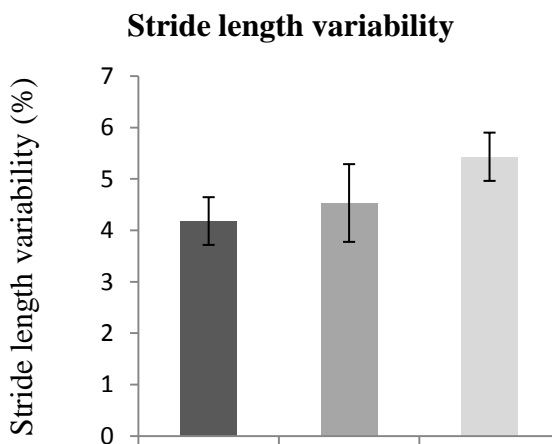
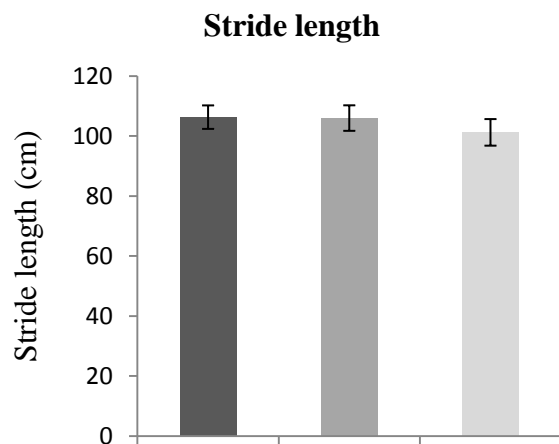
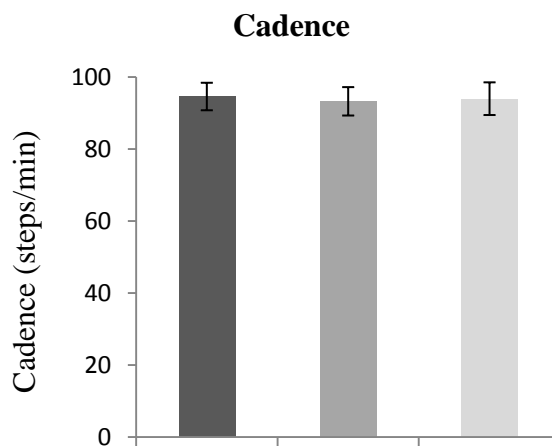
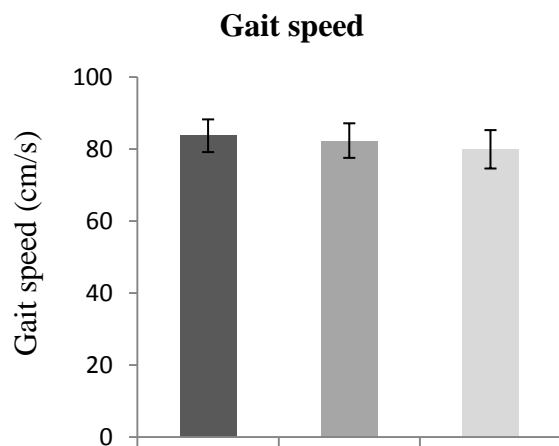


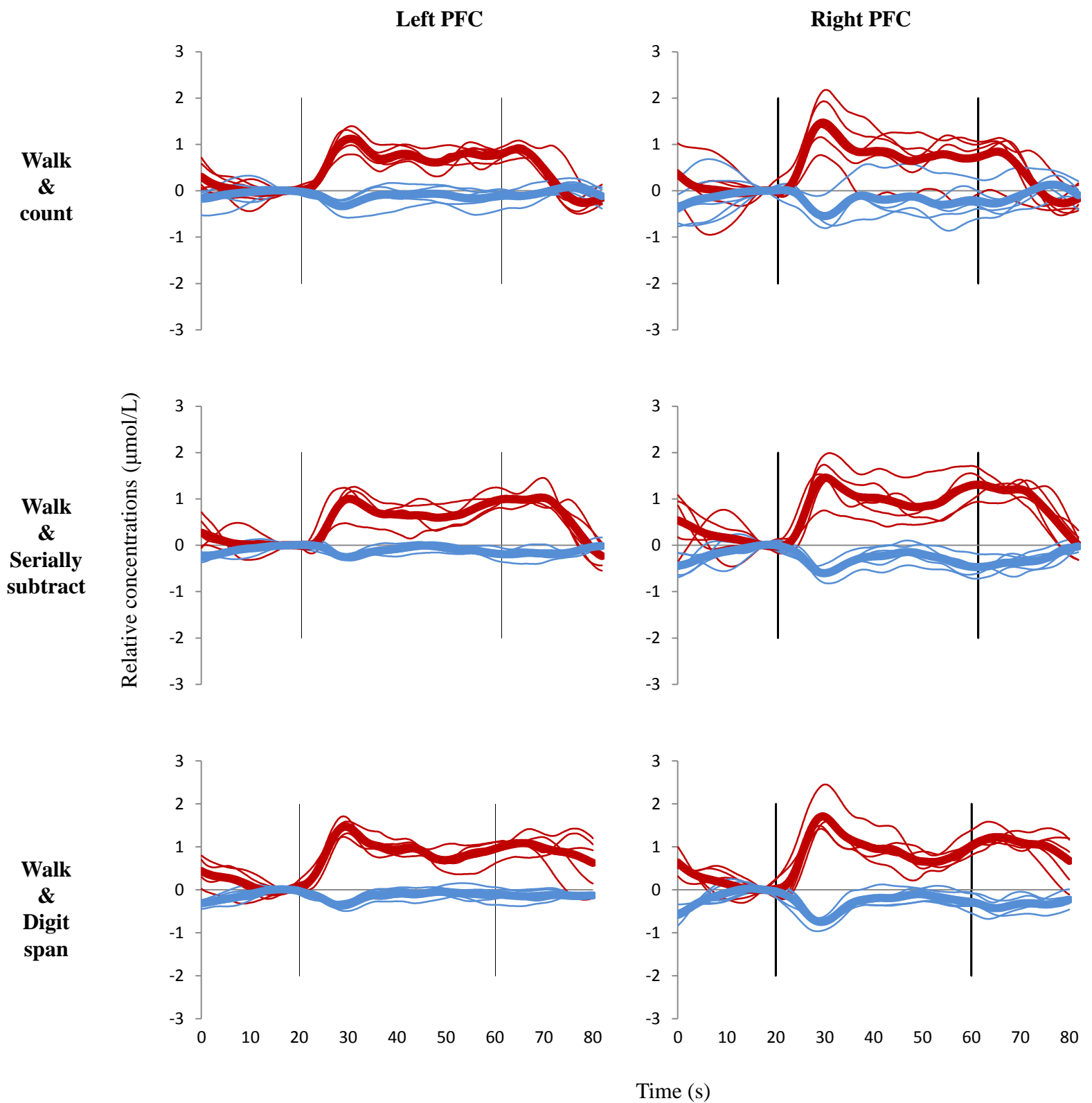
Supplementary figure 1 – Mean concentrations of O2Hb (red) and HHb (blue) relative to rest ( $\mu\text{mol/L}$ ) in left and right prefrontal cortices during walk & count, walk & serially subtract and walk & digit span, mean  $\pm$  sem.



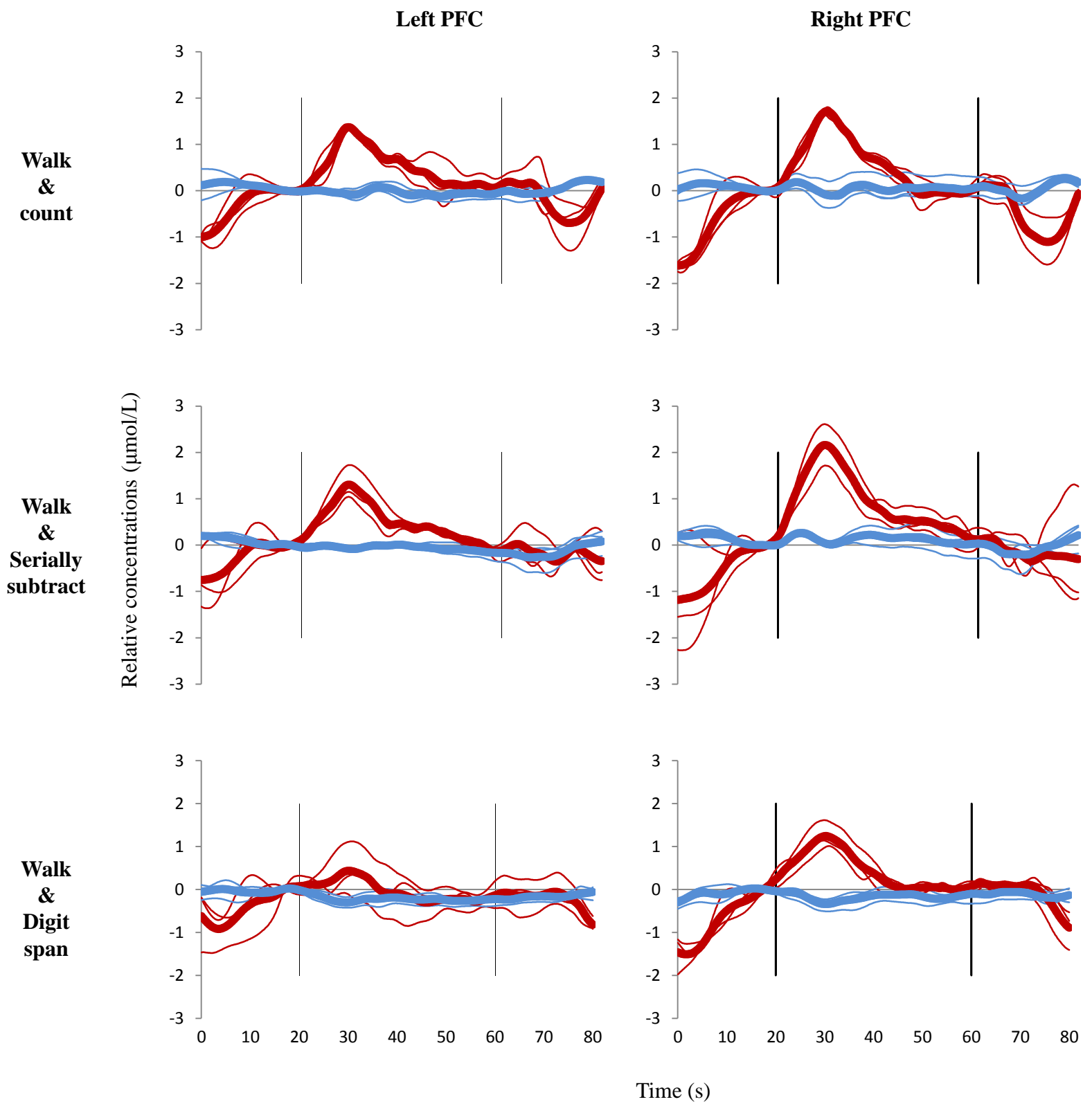
Walk & Count      Walk & Serially Subtract      Walk & Digit span

Walk & Count      Walk & Serially Subtract      Walk & Digit span

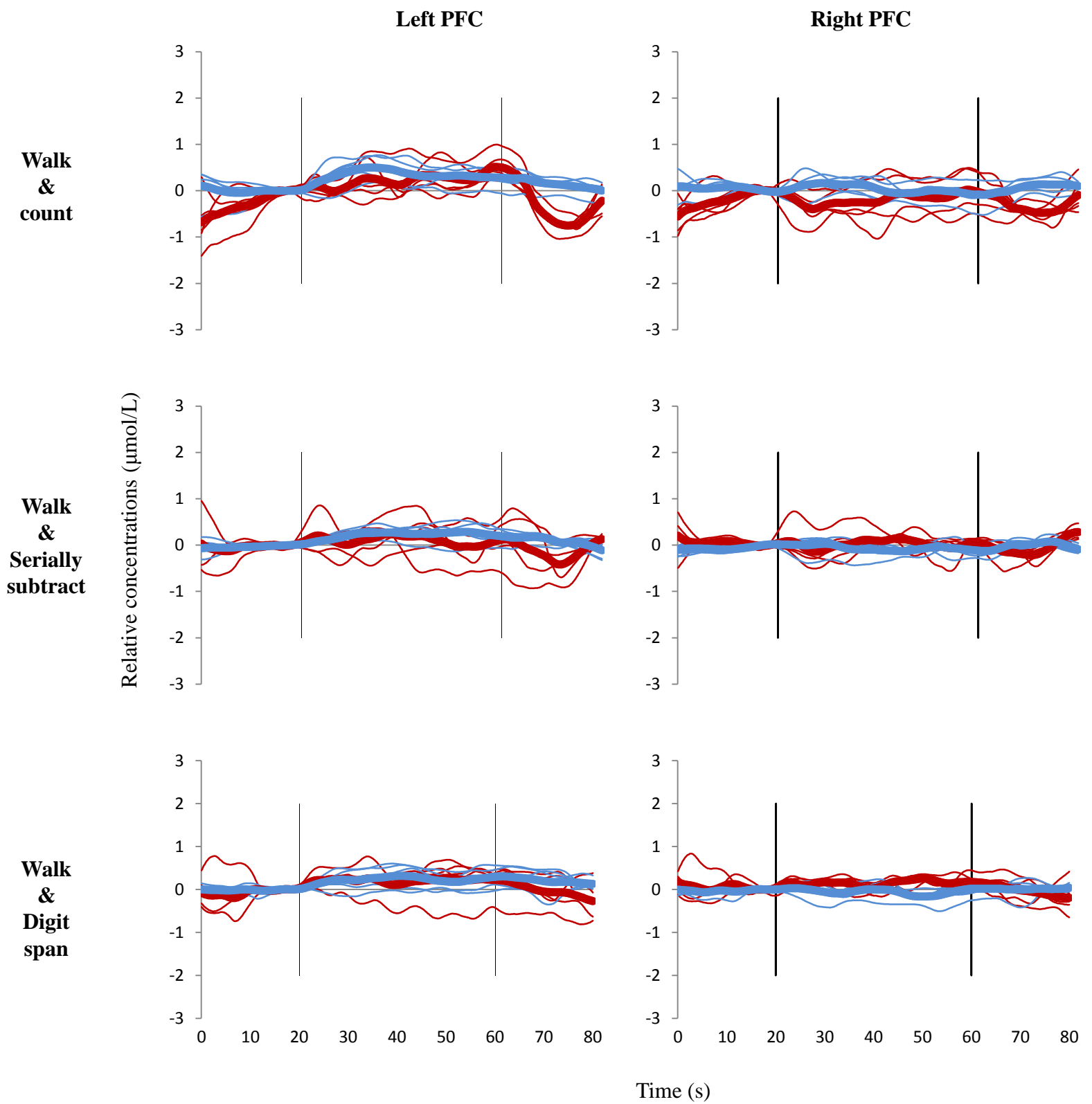
Supplementary figure 2 – Gait performance measures during walk & count, walk & serially subtract and walk & digit span, mean  $\pm$  sem.



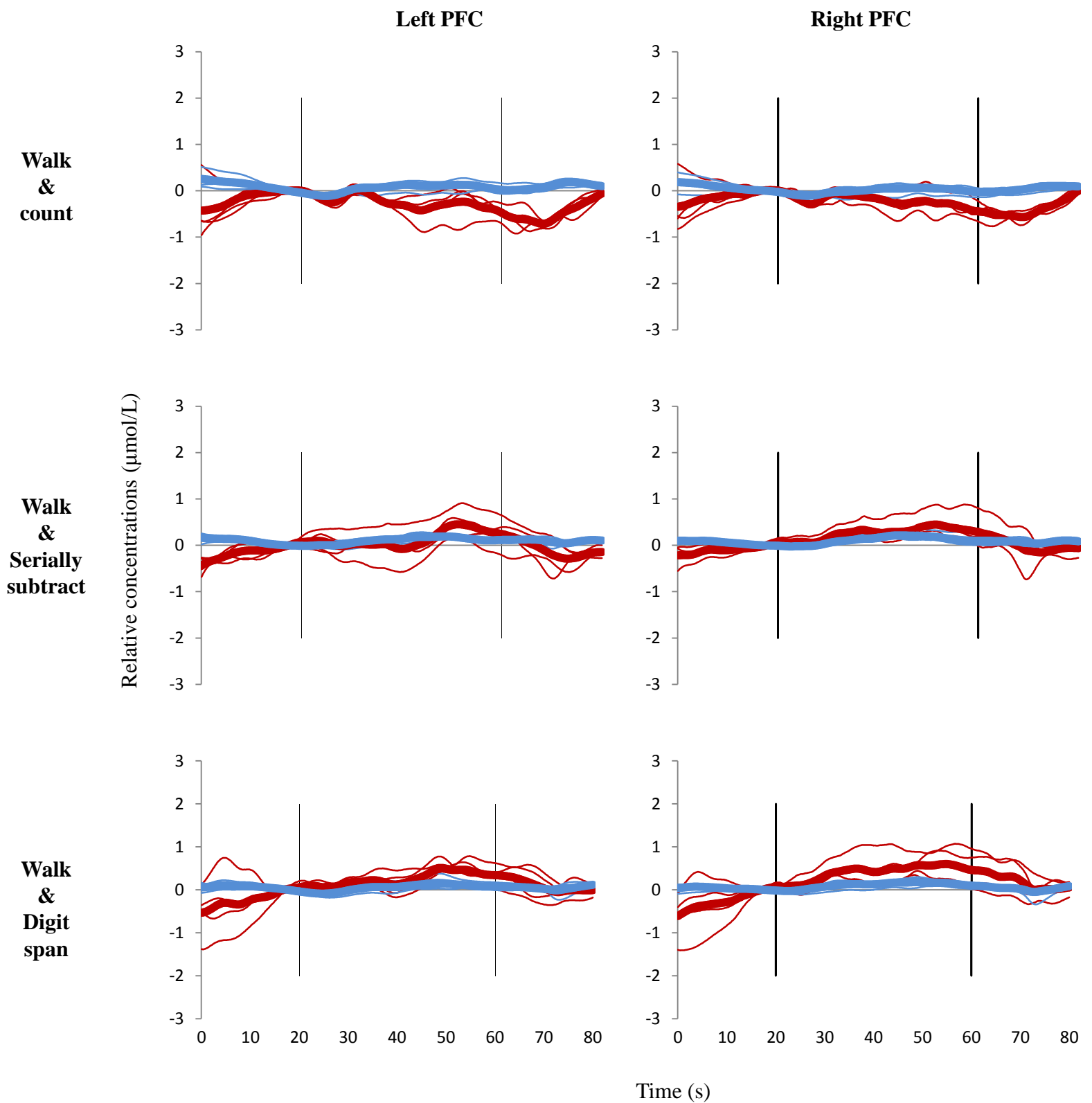
Supplementary figure 3 – Average (thick line) and individual trial (thin lines) time courses of oxygenated hemoglobin (O<sub>2</sub>Hb, red) and deoxygenated hemoglobin (HHb, blue) of a representative participant showing a timecourse as hypothesized. Vertical black lines indicate start and end of task performance. PFC = prefrontal cortex



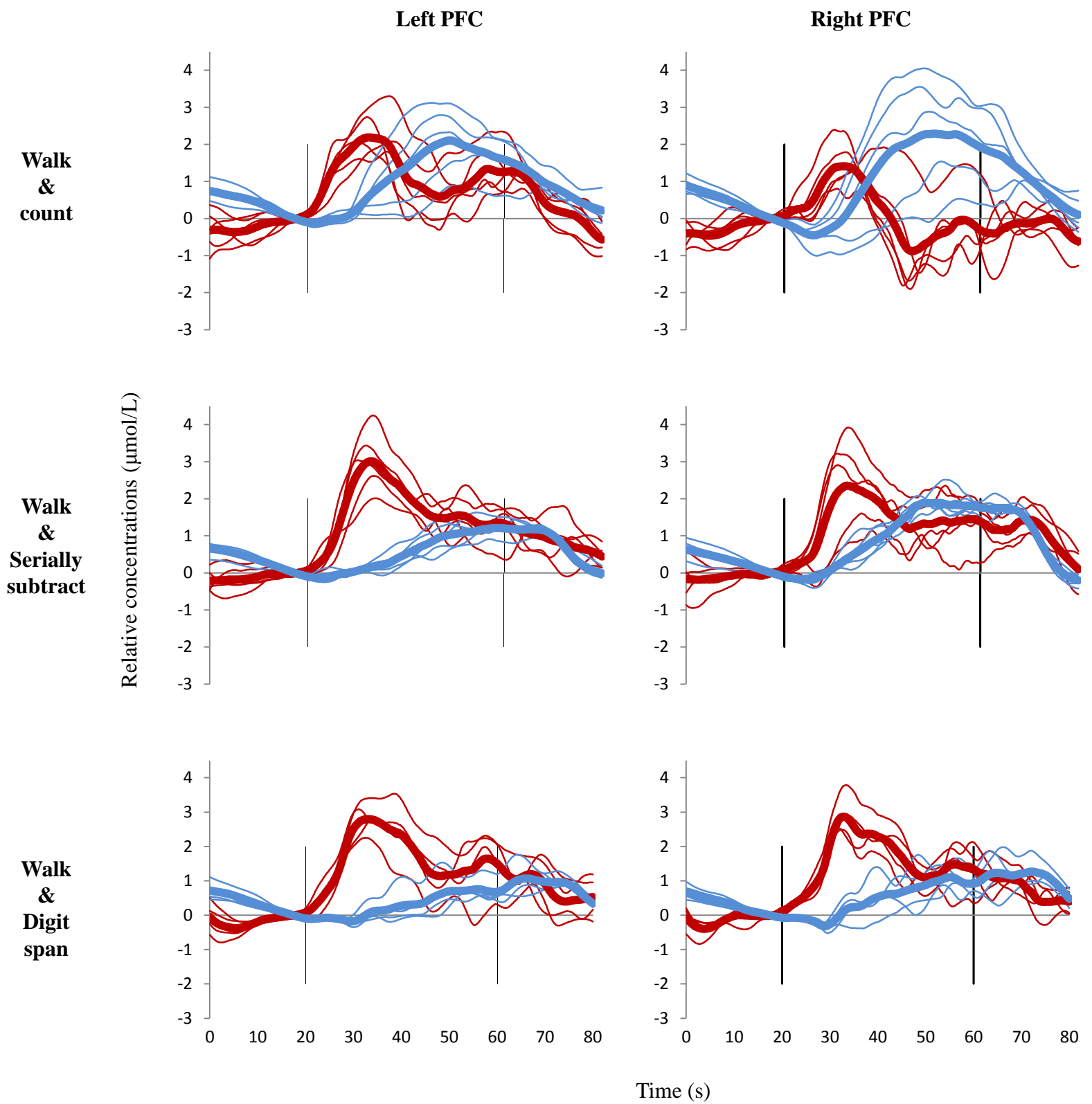
Supplementary figure 4 – Average (thick line) and individual trial (thin lines) time courses of oxygenated hemoglobin (O<sub>2</sub>Hb, red) and deoxygenated hemoglobin (HHb, blue) of the participant showing an initial activation pattern. Vertical black lines indicate start and end of task performance. PFC = prefrontal cortex



Supplementary figure 5 – Average (thick line) and individual trial (thin lines) time courses of oxygenated hemoglobin (O<sub>2</sub>Hb, red) and deoxygenated hemoglobin (HHb, blue) of a representative non-responder. Vertical black lines indicate start and end of task performance. PFC = prefrontal cortex



Supplementary figure 6 – Average (thick line) and individual trial (thin lines) time courses of oxygenated hemoglobin (O<sub>2</sub>Hb, red) and deoxygenated hemoglobin (HHb, blue) of a representative participant showing reduced activation during walking while counting. Vertical black lines indicate start and end of task performance. PFC = prefrontal cortex



Supplementary figure 7 – Average (thick line) and individual trial (thin lines) time courses of oxygenated hemoglobin (O<sub>2</sub>Hb, red) and deoxygenated hemoglobin (HHb, blue) of the participant showing an unexpected pattern. Vertical black lines indicate start and end of task performance. PFC = prefrontal cortex