

## Executive Function Relationships to Sitting Time and Physical Activity: A Pilot Study

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Category: Masters

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### ABSTRACT

Executive function (EF) refers to the neurocognitive perspective of supervisory abilities to self-regulate during goal-directed behavior. More specifically, the ability to attend to and inhibit dominant responses (i.e. Attention/Inhibition) has been found to moderate the intention and physical activity (PA) relationship, yet does not appear to relate to PA. However, this EF is related to other health behaviors, such as smoking and alcohol consumption (i.e. behaviors to be inhibited). The lack of relationship to PA might be due to it being a behavior that is *not* to be inhibited, compared to a behavior that should be inhibited (e.g. sitting time). **PURPOSE:** To compare relationships of various executive functions to physical activity and sitting time. **METHODS:** Sixteen college-aged males ( $n=5$ ) and females ( $n=11$ ) (Age =  $22.38 \pm 1.26$  years; BMI =  $25.57 \pm 7.58$  kg/m<sup>2</sup>) completed the study. At time 1, participants provided demographics, self-reported PA (IPAQ-SF), and were asked to wear a Yamax Digiwalker SW-200 pedometer for 7 days to assess normal, PA in average steps/day (week 1). At time 2, three executive functions were assessed via computer-based tasks: Attention/Inhibition (Stroop task), Planning/Problem Solving (Tower of London), and Working Memory (Corsi Block Task). Participants were provided with a goal 50% greater than their week 1 average step/day count, and all intended to meet this goal over the following 7 days (week 2). **RESULTS:** On average, participants self-reported  $496.88 \pm 142.72$  min/day of sitting, and had an average step count of  $7744.31 \pm 2900.20$  steps/day for week 1. The average step change across week 2 was  $+2245.31 \pm 1102.32$  steps/day – falling short of their prescribed step goal by  $\sim 1627$  steps/day. Attention/Inhibition was positively related to sitting time ( $r = .61, p < .01$ ), and Planning/Problem Solving was the only EF related to change in steps from week 1 to week 2 ( $r = -.53, p < .05$ ). No other EFs related to sitting time, moderate- or vigorous-intensity PA. **CONCLUSION:** The present pilot data supports our initial hypothesis that Attention/Inhibition executive abilities are related to sedentary time, such as sitting, but not PA. To guide future research, Planning/Problem Solving was the only EF to be related PA, while Working Memory was not related to any PA outcomes.

**Keywords:** Executive Function; Physical Activity; Sedentary