Abstract Preview - Step 3/4

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Category of Presentation:	**Research reports**
Primary topic:	OLDER PEOPLE: General
2nd topic:	OLDER PEOPLE: Balance & Falls
Key-Words:	PSYCHOLOGY / PSYCHIATRY
Title:	**DIFFERENTIATING BETWEEN OLDER ADULTS WITH AND WITHOUT EXECUTIVE FUNCTION IMPAIRMENT USING SINGLE- AND DUAL-TASK WALKING SPEEDS**

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Text: **Purpose:** Walking performance is closely related to complex cognitive function, especially executive function. This study were aimed to: (1) examine whether walking speed in both single- and dual-task conditions could differentiate between older adults with and without executive function impairment and (2) determine the optimal cut-off walking speed values in single- and dual-task conditions for such differentiation.

Relevance: This study offered simple clinical tools to differentiate between older adults with and without executive function impairment by using walking tasks.

Participants: Twenty-four healthy adults (age= 73.4±6.9 years), 9 patients with mild cognitive impairment (MCI) without executive function deficits (MCI-EF; age= 70.8±5.4 years), 15 MCI patients with executive function deficits (MCI+EF, age= 76.0±5.9 years), and 26 patients with mild Alzheimer Disease (AD) (age= 77.6±7.2 years) participated in this study. All participants could walk independently and had no other neurological, musculoskeletal, or cardio-pulmonary disorders.

Methods: Subjects were instructed to walk along a 5-m-long walkway at a comfortable pace in the single-task, motor dual-task, and cognitive dual-task conditions. In the single-task condition, subjects performed walking only. In the motor dual-task condition, subjects performed walking and carried a cup of water simultaneously. In the cognitive dual-task condition, subjects performed walking and undertook the serial 7s subtraction test simultaneously. The walking speed in all three conditions was recorded.

Analysis: One 4 × 3 Repeated Measures ANCOVA procedure was used to compare the walking speed among the four groups across the three walking conditions, adjusting for age. The receiver operating characteristic (ROC) analysis was used to determine the cut-off walking speed value best differentiating subjects who had executive function impairment from those who did not.

Results: There was a significant condition effect across all subject groups. All four groups walked the fastest in the single-task condition and the slowest in the cognitive dual-task condition ($P<0.05$). The MCI+EF and AD groups had slower walking speed than the healthy and MCI-EF groups in all three conditions ($P<0.05$). No differences in walking speed were shown between the healthy and MCI-EF groups or between the MCI+EF and AD groups. The ROC analysis showed that to differentiate between older adults with and without executive function impairment, using the cut-off walking speed of 0.89m/sec in single-task condition had sensitivity of 78.8%, and specificity of 79.3%; using the cut-off walking speed of 0.81m/sec in motor dual-task condition had sensitivity of 78.0%, and specificity of 81.7%; and using the cut-off walking speed of 0.73m/sec in cognitive dual-task condition had sensitivity of 81.8%, and specificity of 81.7% ($P<0.05$). Older adults who walked slower than these speeds in the corresponding conditions were more likely to have executive function impairment.

Conclusions: Walking speed in single- and dual-task conditions both could be use to differentiate older adults who had executive function impairment form those did not. However, using walking speed in the cognitive dual-task condition could best differentiate between older adults with and without executive impairment. Future work using larger sample sizes is warranted.

Implications: Examining walking speed in dual-task conditions may help clinicians early identify older adults with executive function impairment and at risk of falls.

Key-Words:	1. Dual-task 2. Walking speed 3. Executive function

Preferred Presentation Type: **Poster presentation**

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