

# High Cognitive Load Situations Decrease Both Walking and Cognitive Performance

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## Background

- A high cognitive load situation (HCLS) is completing two or more tasks simultaneously.
- Aging is associated with generally reduced attentional resources which can manifest as problems with certain cognitive functions.
- Differential allocation of attentional demands creates a HCLS, potentially deteriorating cognitive and/or gait performance, impacting fall risk.

## Purpose

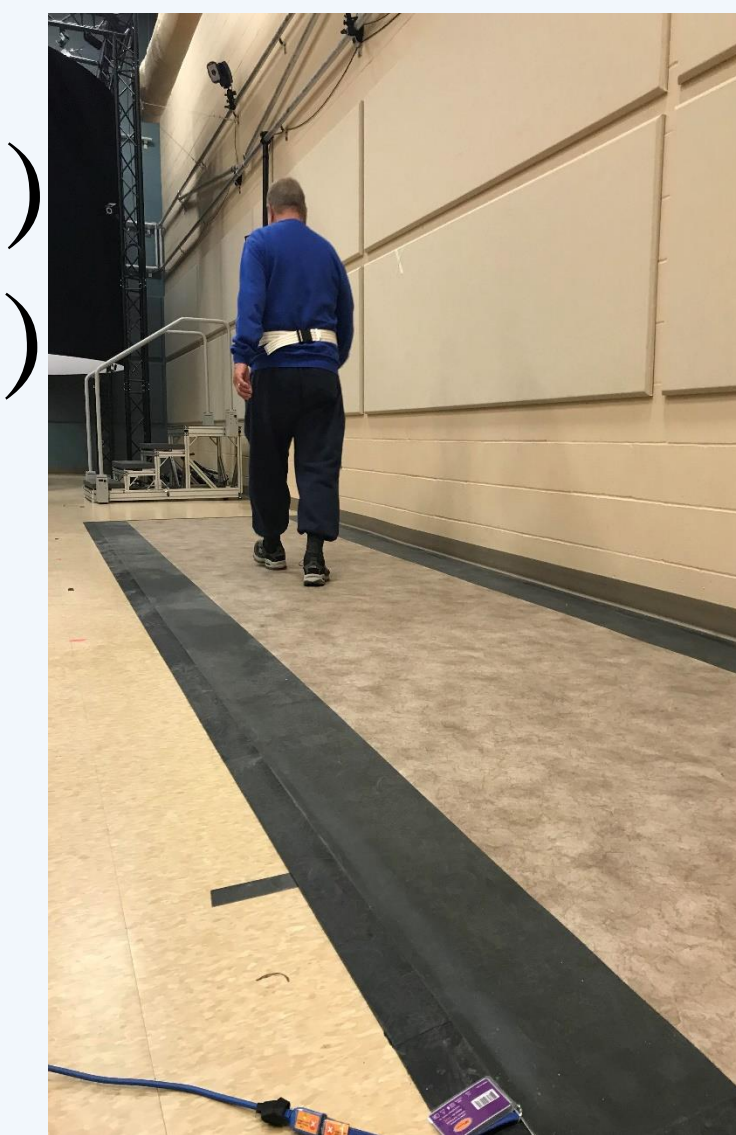
To explore whether different load types [(Single-task (ST)): talking/walking only, and HCLS: walking while talking on a phone)] impacted gait and cognitive performance across different age groups.

## Methods

- Subjects (N= 37)
  - ❖ Young (n=8; age=23.16±1.96yrs)
  - ❖ Middle-aged (n=14; age=44.79±7.42yrs)
  - ❖ Older (n=15; age=74.47±3.91yrs)
- Single task (3 minutes)
  - ❖ Walking only (two trials: Self-paced overground)
  - ❖ Talking on the phone while seated with easy and hard conversation topics
- HCLS (3 minutes; two trials)
  - ❖ Walking and talking with easy and hard conversation topics

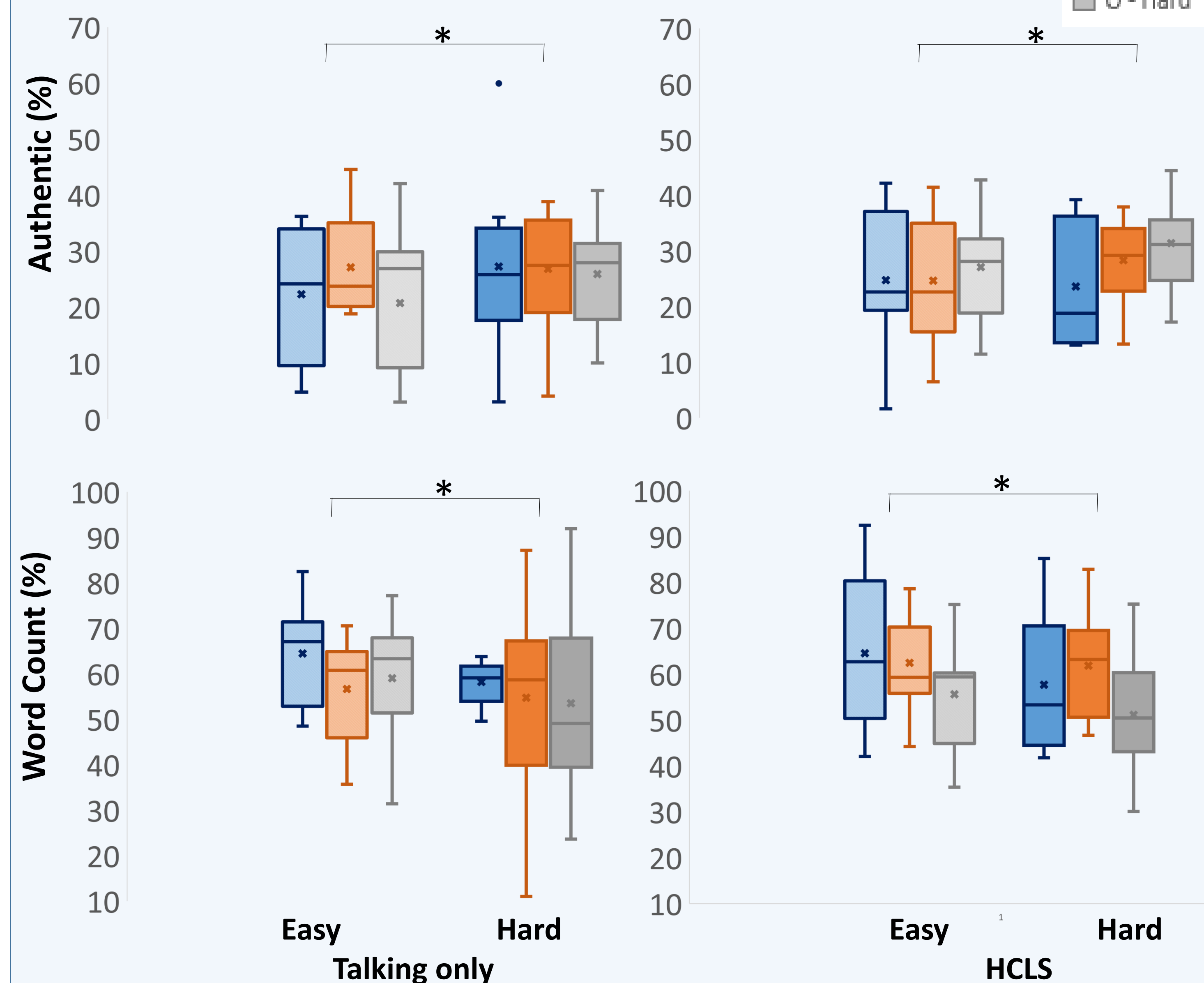
## Method

- Conversation topics
  - ❖ Easy (e.g., favorite food, weather, etc.)
  - ❖ Hard (e.g., personal relationships, etc.)
- Gait performance was evaluated using:
  - : Step width, stride length, and speed.
- Cognitive performance – speech fluency
- Linguistic Inquiry and Word Count
  - : Word count and Authenticity.

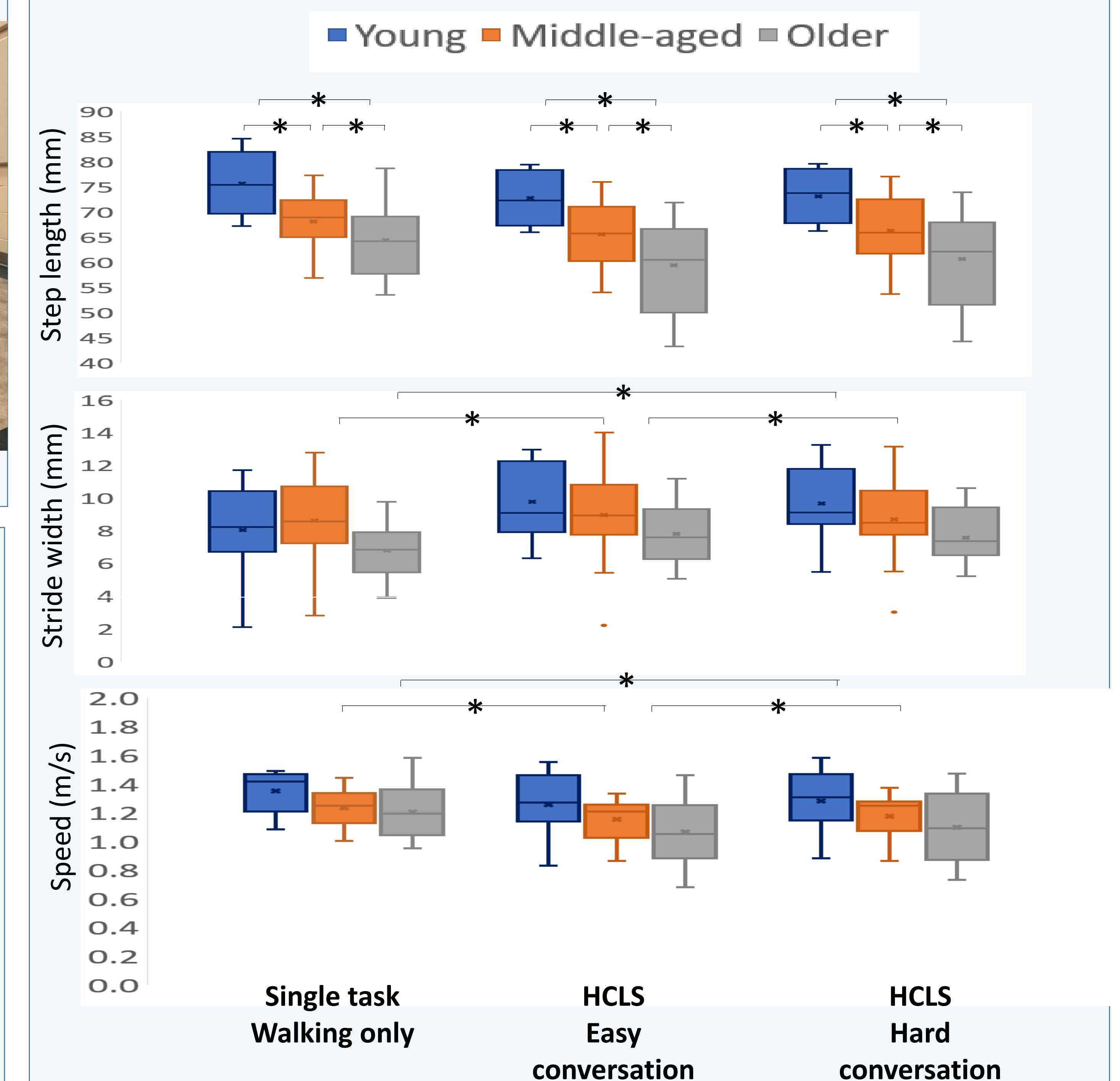


## Results

- HCLS resulted in slower speed and wider SW across groups.
- Difficult topics negatively impacted participants' cognitive performance.



## Results



## Discussion

The HCLS in this study negatively impacted gait and cognitive performance. Understanding this relationship may ultimately inform development of interventions to improve allocation of attentional demands, potentially mitigating fall risk.

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