Drums Alive Golden Beats Improves Brake Onset Time in Older Adults

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INTRODUCTION

- Driver reaction time (RT) is one of the most important factors related to accident avoidance. Increased RT reduces the window of opportunity to appropriately stop or maneuver a motor vehicle.

- Maintaining a physically active lifestyle can help attenuate age-related declines in RT.

- Drums Alive® is a therapeutic movement program that uses choreographed rhythmic movements to improve cardiorespiratory health, mobility and flexibility.

- This study aimed to determine if a 10-week Drums Alive® intervention, Golden Beats, could improve brake onset time in community dwelling older adults.

METHODS

- Eleven community-dwelling volunteers (2 males) completed the Drums Alive® intervention (mean age = 68.82 years, SD = 5.33). Eleven age and sex matched control participants (2 males) completed the stretching intervention (mean age = 68.76 years, SD = 4.76).

- Participants completed a Drums Alive® intervention consisting of 20 one-hour sessions over the course of 10 weeks (2 sessions per week).

  – Each Drums Alive® session started with a 5-minute warm-up followed by 40 minutes of choreographed rhythmic movements and a 5-minute cool-down.

- Control participants completed a stretching intervention consisting of one-hour sessions, that met 3 times a week.

  – Each stretching session started with a 10-minute warm-up on a recumbent bike followed by 50 minutes of total body stretches and targeted isometric holds (i.e., scapular retraction).

- A computerized driving simulation task was used to measure simple reaction time (sRT), movement time (MT), and total time (TT) on a brake onset task (STISIM Drive, Systems Technology Inc., Hawthorne, CA). sRT, MT, and TT were recorded for 5 trials. The first two trials were considered practice trials. Mean values for sRT, MT, and TT were used for all analyses.

  – Participants were instructed to fully depress the accelerator to begin the trial. Full depression of the accelerator triggered the presentation of a green light on the computer monitor. Participants were instructed to fully depress the accelerator until the green light changed to a stop sign. Participants were instructed to remove their foot from the accelerator (sRT) and press the brake (MT) as soon as they perceived the stop sign. Green light presentation times varied across the 5 trials. Specifically, green-to-red transition times were randomized and fell within a minimum of 3 seconds and a maximum of 8 seconds. Participants were allowed to practice the maneuver three times prior to testing.
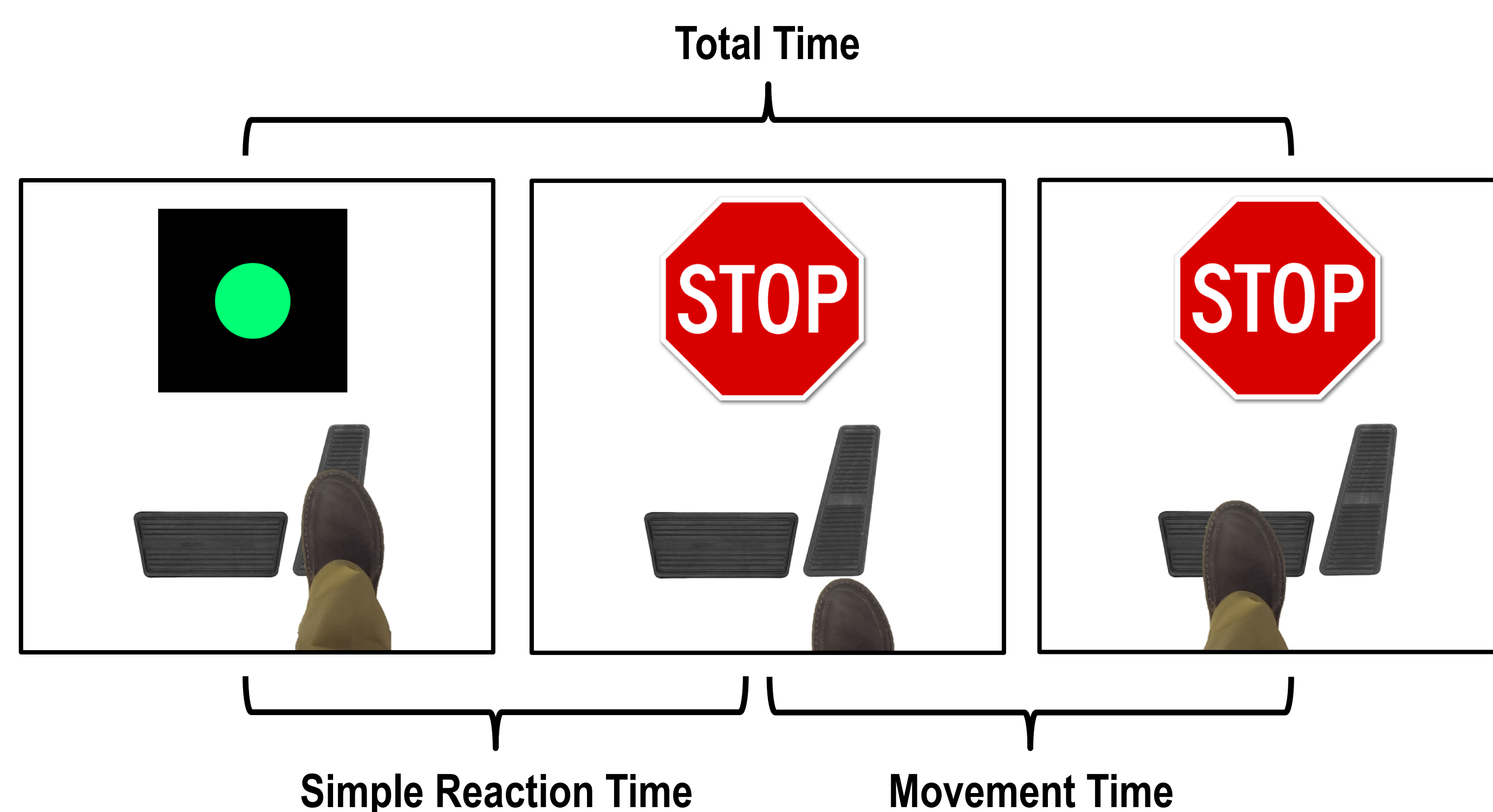
METHODS (cont.)

Fig. 1. Brake onset reaction time test. Participants were instructed to remove their foot from the accelerator (simple reaction time; sRT) and press the brake (movement time; MT) as soon as they perceived the stop sign. The sum of sRT and MT represents the total time (TT) of the brake onset test.

Fig. 2. Representative Drums Alive® Golden Beats class. Drums Alive® Golden Beats exposes participants to a drumming and movement experience designed to enhance function and mood.
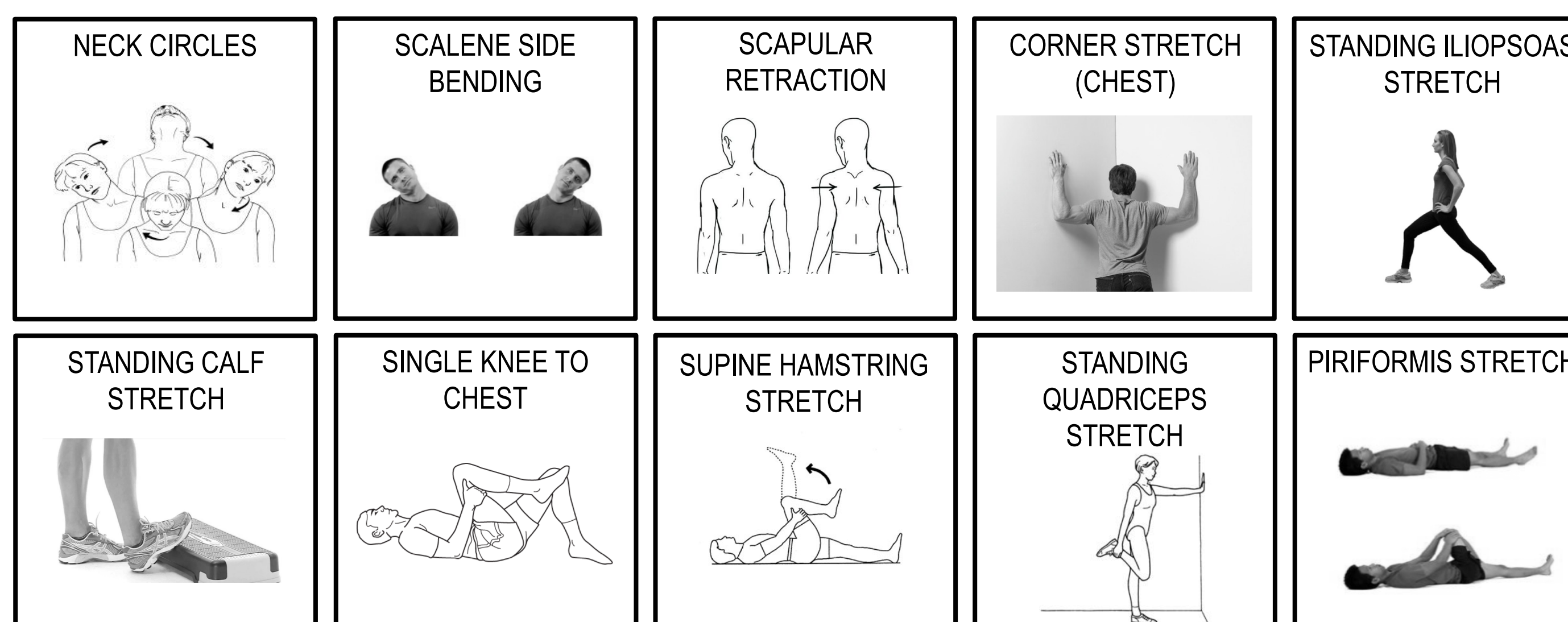

Fig. 3. Representative stretching exercises. Participants were instructed to hold all stretches for a minimum of 30 seconds (maximum of 60 seconds) for 3 sets. Isometric holds were held for 5 seconds. Ten additional stretches were offered as progressive or alternative options (not pictured).
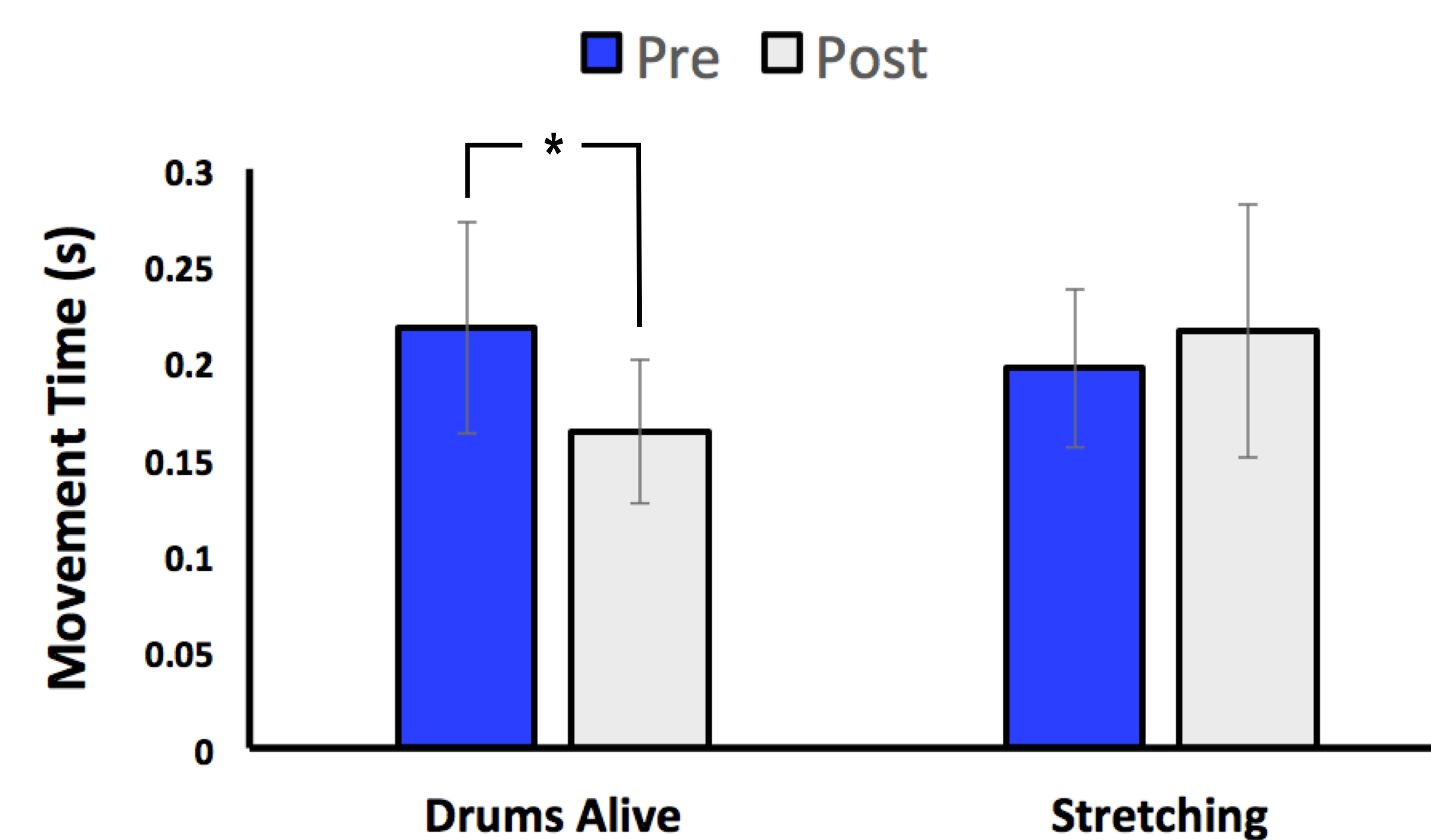
RESULTS

Fig. 4. Brake onset reaction time test. There was a statistically significant difference in pre- to post-intervention movement time between the Drums Alive® (M = -0.052, SD = 0.063) and control groups (M = 0.007, SD = 0.039; t (22) = 2.61, P = .017, two-tailed). The magnitude of the differences in the means (0.059, 95% CI: 0.012 to 0.106) was large (eta squared = 0.25). Note: *P <.05

DISCUSSION

- Driver reaction time is essential to roadway safety. Age-related declines in reaction time limit driving performance in older adults.

- Findings suggest that a choreographed rhythmic exercise intervention benefits a constituent component of driving-related reaction time.

- Brake onset movement time improved in older adults who participated in Drums Alive® Golden Beats but not in older adults who completed a low-intensity stretching intervention.

- Findings suggest that a music- and rhythm-based form of physical activity can be used to improve motor performance in older adults.

- Physical therapists are in a unique position to promote novel intervention strategies aimed at improving motor performance in any population.

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