



# The Complex Assessment of Military Performance: Dual-Task Agility Test-Retest Reliability



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## Background

The Complex Assessment of Military Performance (CAMP) is a 3-item performance-based test battery that challenges known physical vulnerabilities post-mTBI. CAMP was created with aim of aiding clinicians in determination of readiness to return-to-duty among service members. Dual-task interference after mTBI exceeds that observed in healthy control peers, making it a reasonable focus for a clinical test.

The Dual-Task Agility test is one component of the CAMP battery, mimicking military training and targeting possible deficits in balance, agility, memory and the ability to manage a “fighting load” that could impede successful return to duty after mTBI.

## Objectives

1. To determine test-retest reliability of the dual-task agility components in a military healthy control group tested twice, one month apart.
2. Identify possible practice effects of the task to aid in interpreting test results.

## Methods

### Participants:

14 active-duty service members (11 Army, 2 Marines, and 1 Navy) deemed deployable; average age 29 years; 13 males and 1 female with no history of severe TBI; absence of mTBI in the past two years and no ongoing complaints related to prior mTBI.

### Test protocol:

- 1- Single task cognitive grid coordinate working memory task (accuracy of 8 items recalled)
- 2- Single task agility course familiarization and 1<sup>st</sup> trial (time to hundredths of second)
- 3- Dual-task agility course with cognitive task (recall at end of motor task)
- 4- Single task agility course wearing weighted vest (30% body weight)
- 5- Dual-task agility course with cognitive task with weighted vest

## Dual-Task Agility

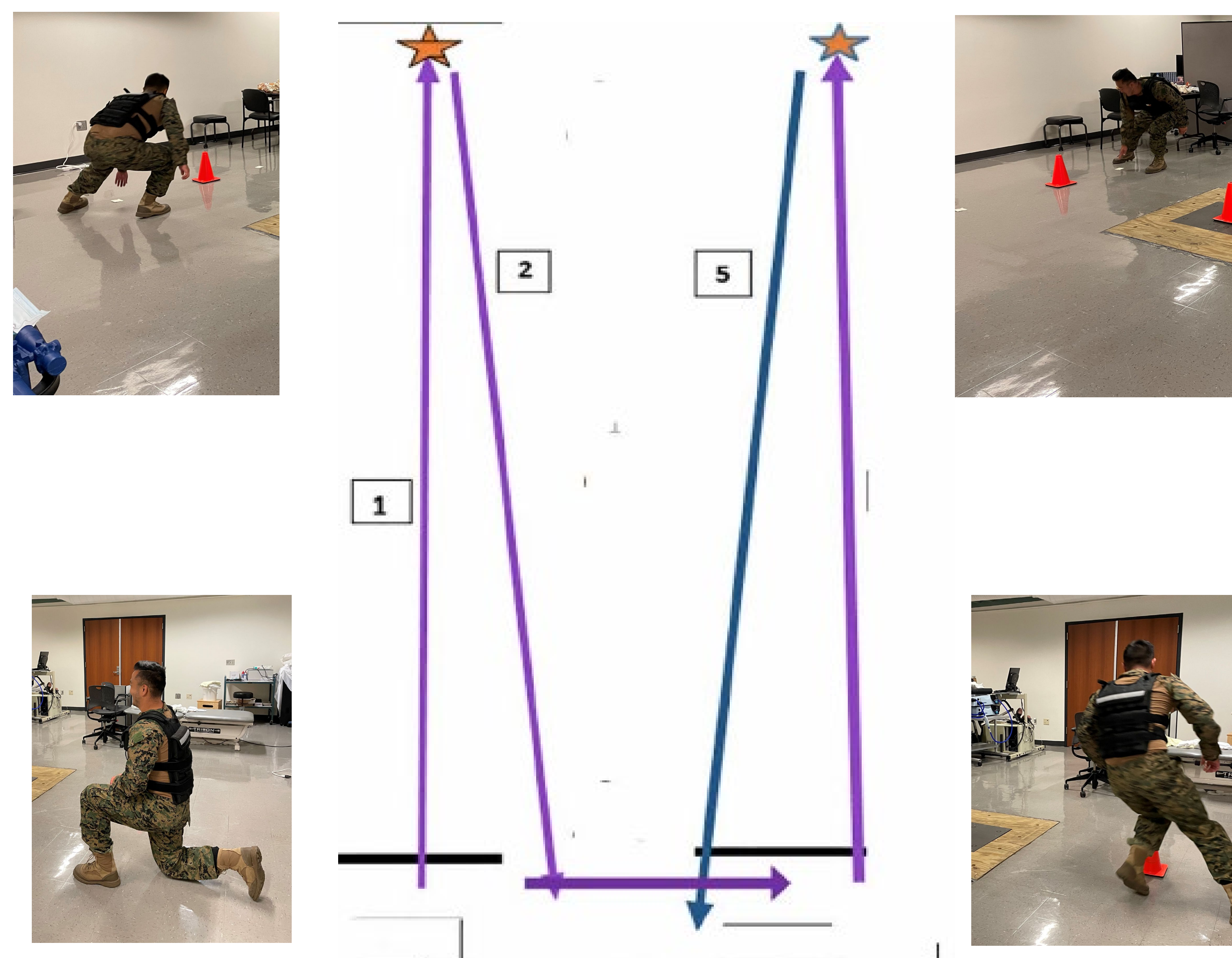
**Cognitive Component:** grid coordinate working memory (example below)

At start of trial, Researcher states: **“Delta-Tango-4-9-7-3-9-2”**

At end of trial, participant recites characters recalled: **“Delta-Tango-4-9-7-3-2-9 ”**

Scoring is based on number of characters stated correctly in the correct sequence. For example, above score would be 6/8.

**Motor component:** Start in ½ kneel, transition kneel to standing, run forward 15’, touch floor marker, turn toward cones, run forward 15’, turn around start cone, run forward 15’, touch floor marker, turn toward cones, run forward 15’ to finish

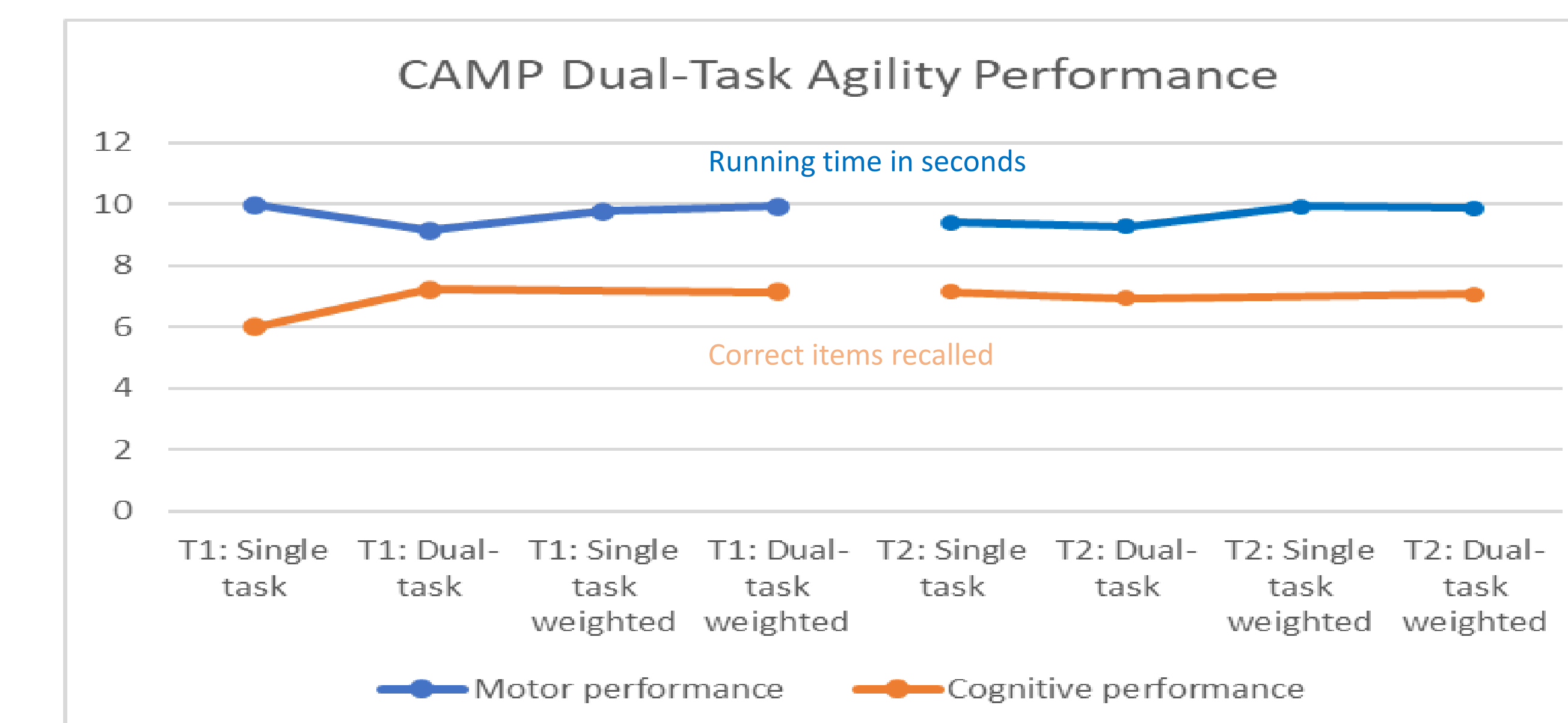


**Dual-task condition:** Grid coordinate provided prior to start of the motor component and participant recalls coordinate items after completing the motor component.

## Results

Trial	Initial Testing	Final Testing	ICC
<b>Cognitive performance (of 8)</b>			
Single Task	6.00	7.14	0.75
Dual-Task Unweighted	7.21	6.93	0.48
Dual-Task with Weighted Vest	7.14	7.07	0.26
<b>Motor task performance (sec)</b>			
Single Task	9.97	9.41	0.35
Dual-Task Unweighted	9.14	9.27	0.84
Single Task with Weighted Vest	9.76	9.91	0.68
Dual-Task with Weighted vest	9.93	9.87	0.73

Table 1. Mean Values and Inter-rater Reliability for Dual-task Agility



## Conclusions

Motor performance on the dual-task agility course improves on average slightly after the task is introduced, with slight slowing associated with the weighted vest use and the dual-task condition but overall is stable. A learning effect is evident with the cognitive task, but stabilizes with practice as the dual-task conditions occur. ICC values for the motor task are acceptable, but the cognitive ICC values vary considerably, perhaps because of a restricted range of values. This test provides a relatively stable dual-task scenario that may have value for concussion assessment, using cognitive and high-level motor challenges with a “fighting load” condition that approximates military training activities.