

Differences in Anticipated and Unanticipated Task Performance in Those With and Without CAI

Kéla H. Porter

University of Kentucky
Sports Medicine Research Institute
Lexington, KY, USA

Disclaimer & Acknowledgments

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Chronic Ankle Instability (CAI)

- Ankle sprains are among the most prevalent musculoskeletal injuries in the military
- Approximately 30-40% of lateral ankle sprain patients go on to develop CAI
- CAI is characterized by ongoing pain, ankle joint instability, repetitive injury recurrence, and persistent functional disability
- CAI may develop as early as 6 to 12 months after the initial lateral ankle sprain

Purpose

- Multidirectional tasks are often reported as difficult and provoke instability in those with CAI
- Perceptual-cognitive challenges have been added to multidirectional tasks in athletics to get a more accurate representation of performance
- The influence of perceptual-cognitive challenges on task performance in those with CAI is not well understood

The purpose of this study was to assess performance differences between anticipated and unanticipated cutting and agility tests in those with and without CAI

Participant Characteristics

- Inclusion:
 - *aged 18-44*
 - *physically active*
 - *≥ 1 ankle sprain*
 - *no sprain within 4 weeks*
 - *giving way within 3 months*
 - *All score ≥ 5*
 - *IdFAI ≥ 11*

	CAI (N=60)	Healthy (N=66)
Age (years)	21.05 $\pm$ 4.68	22.27 $\pm$ 5.90
Height (cm)	170.84 $\pm$ 9.76	168.69 $\pm$ 8.08
Weight (kg)	75.55 $\pm$ 13.29	68.39 $\pm$ 13.86

Run Decide (RD)



Rapidly transitioning from a prone position to standing, sprint, and make a 45-degree cut to the left or right to deactivate the sensor that illuminated blue

Anticipated: They knew if the blue sensor would be on the left or right before starting the trial

Unanticipated: The cut direction was randomized

Outcome Measures: Decision time and total time

Agility Drill (AD)



Start standing in the center of a 4m x 4m square equipped with sensors. They identified and deactivate a dark blue sensor, returned to the starting position, and repeated that process.

Anticipated: Sensors illuminated in a counterclockwise direction

Unanticipated: 4 sensors illuminated a unique color simultaneously

Outcome Measure: total time

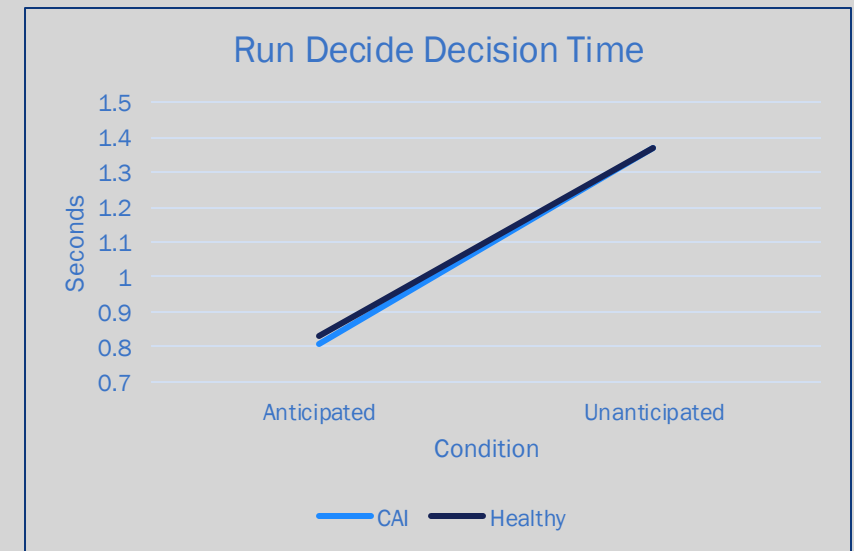
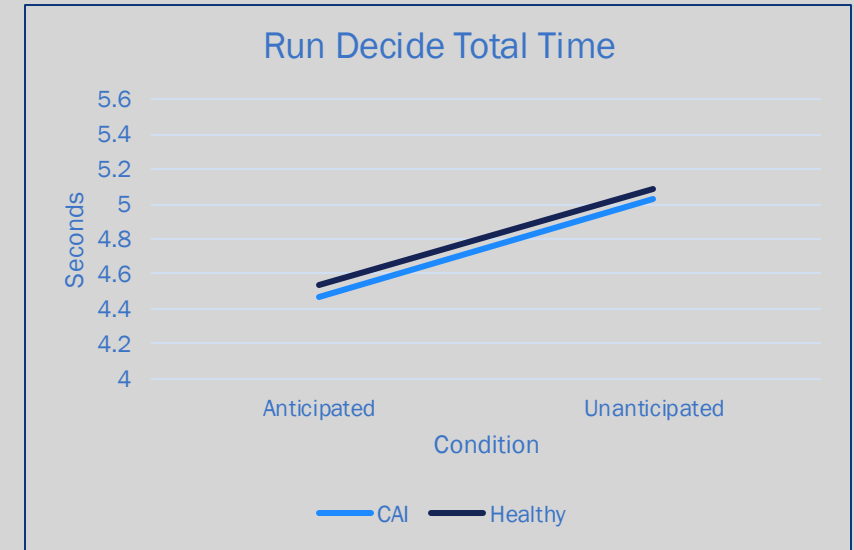


Statistical Analysis

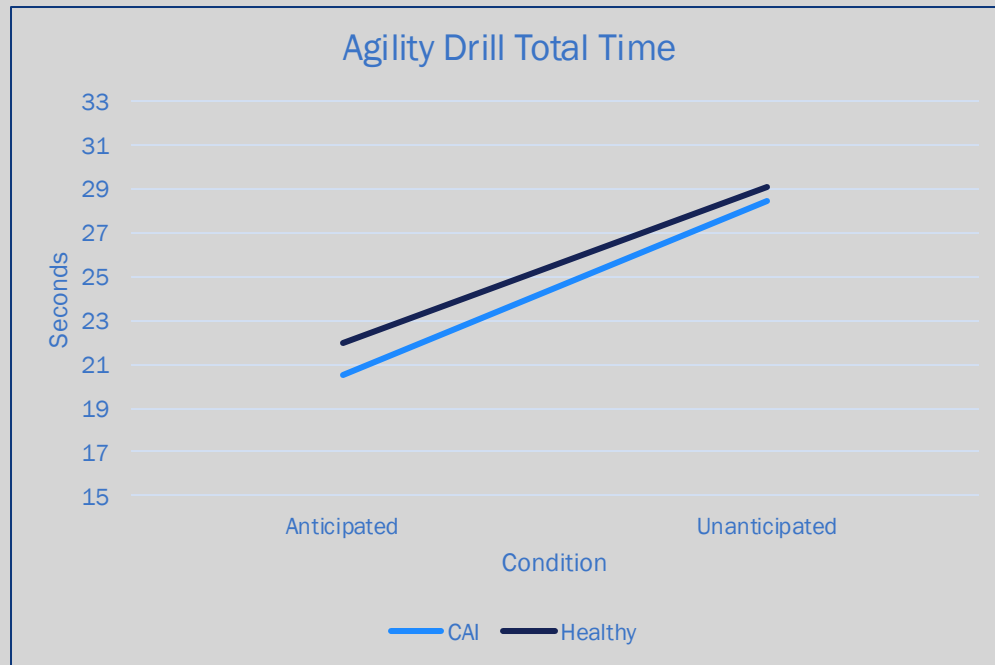
- Descriptive statistics were calculated for participants, run-decide, and agility drill data
- Separate 2x2 ANOVAs assessed differences between groups (healthy, CAI) and conditions (anticipated, unanticipated) for RD and AD
- Cohen's *d* effect sizes were calculated

Run-Decide Results

- A significant condition effect was observed ($p < 0.001$)
- No significant group effects or group-by-condition interactions were identified
- Unanticipated RD had a longer total time than the anticipated RD ($p < 0.001$, $d = 1.29$)
- Unanticipated RD had a longer decision time than anticipated RD ($p < 0.001$, $d = 2.53$)



Agility Drill Results



- A significant condition effect was observed ($p < 0.001$)
- No significant group effects or group-by-condition interactions were identified
- Unanticipated AD had a longer total time than anticipated AD ($p < 0.001$, $d = 2.01$)

Discussion

- No differences in performance were identified between the CAI and healthy group for either task
 - *The RD and AD are not good assessments tools to identify those with CAI*
 - *Our analysis assessed task performance; however, assessing the biomechanics of how individuals perform the task may be beneficial*
- There were significant differences between the anticipated and unanticipated condition of all the tasks
 - *Adding a cognitive challenge to tasks decreases performance*
 - *This may be beneficial in providing better insight into readiness and return to duty*

Limitations and Future Directions

- Limitations
 - *These tasks may not have been challenging enough to invoke group differences*
 - *This study included physically active adults, but that physical activity may vary with differing levels of experience with cutting and agility tasks*
- Future research should assess different tasks with varying levels of difficulty which may impact performance and influence group differences
- Future research should assess how a motor-cognitive intervention may impact performance

QUESTIONS?

Kéla Porter
kela.porter@uky.edu

