

# Analysis of Cognitive Load in Personalized Emergency Medical Training Using Augmented Reality

## PRESENTERS



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**PURPOSE:** To determine the efficacy of Augmented Reality (AR) based training which may help address current EMS training limitations.

**BACKGROUND:** AR and video training have been used to teach skills across a variety of tasks, but its effects on cognitive load and performance on a work-related AR interface remains understudied.

## METHODS

1. 51 participants (6 missing/noisy data)

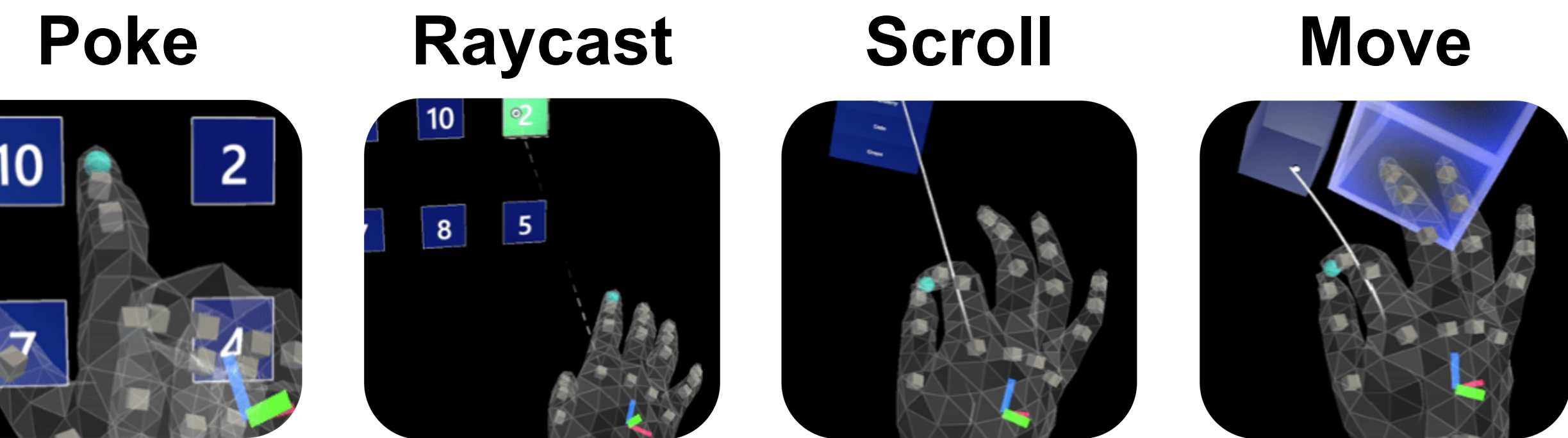
- < 1 hour of AR/VR experience
- 51% female

2. Training and evaluation of 4 augmented reality interactions

- *Training group:* AR-based (n=22) and video-based (n=23)

1. *Metrics:* Performance, subjective surveys, physiological responses

2. *Two-way ANOVA:* Training Group (AR vs Video) x Gender (Male vs Female)



## RESULTS

### • HRV

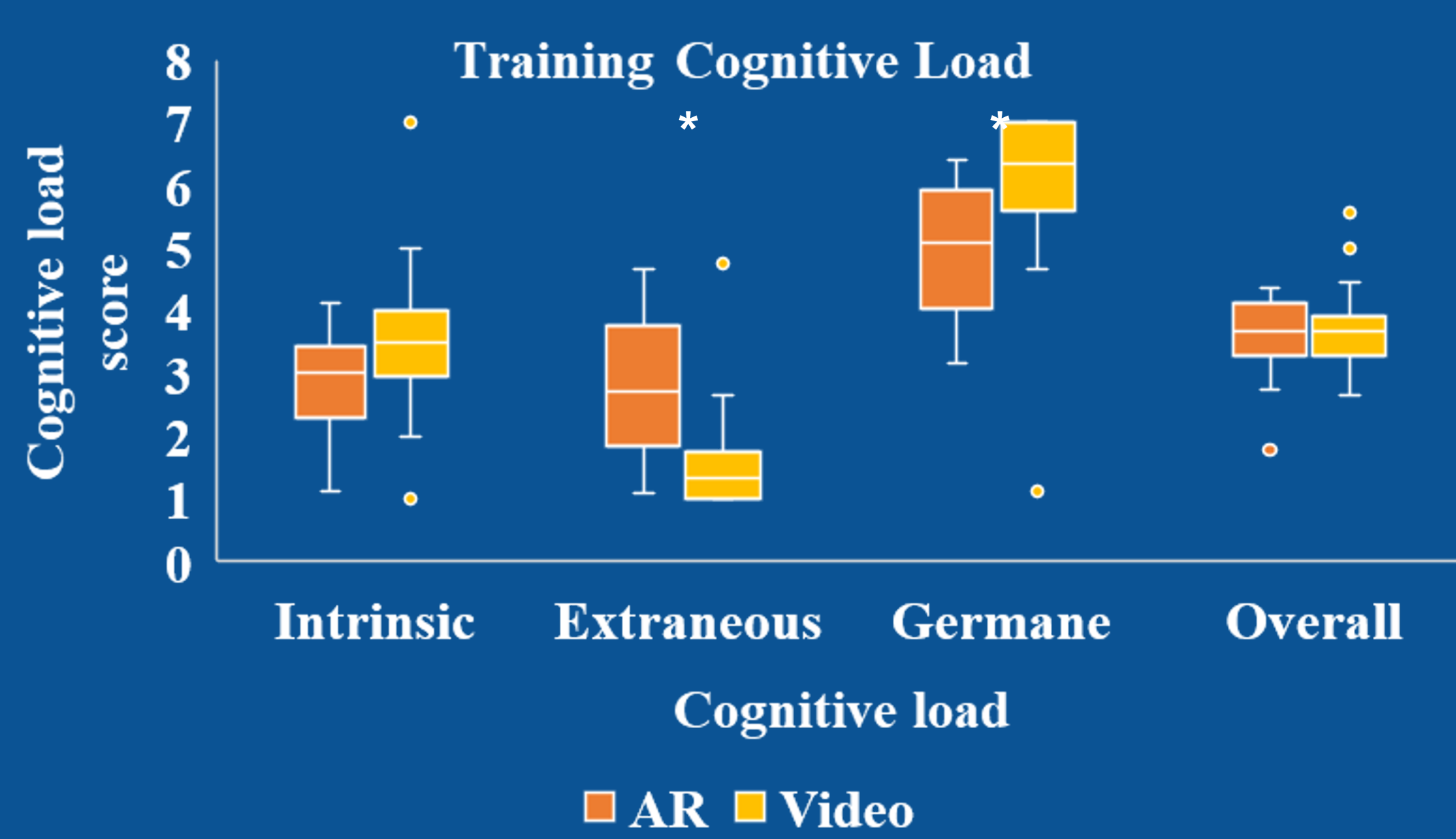
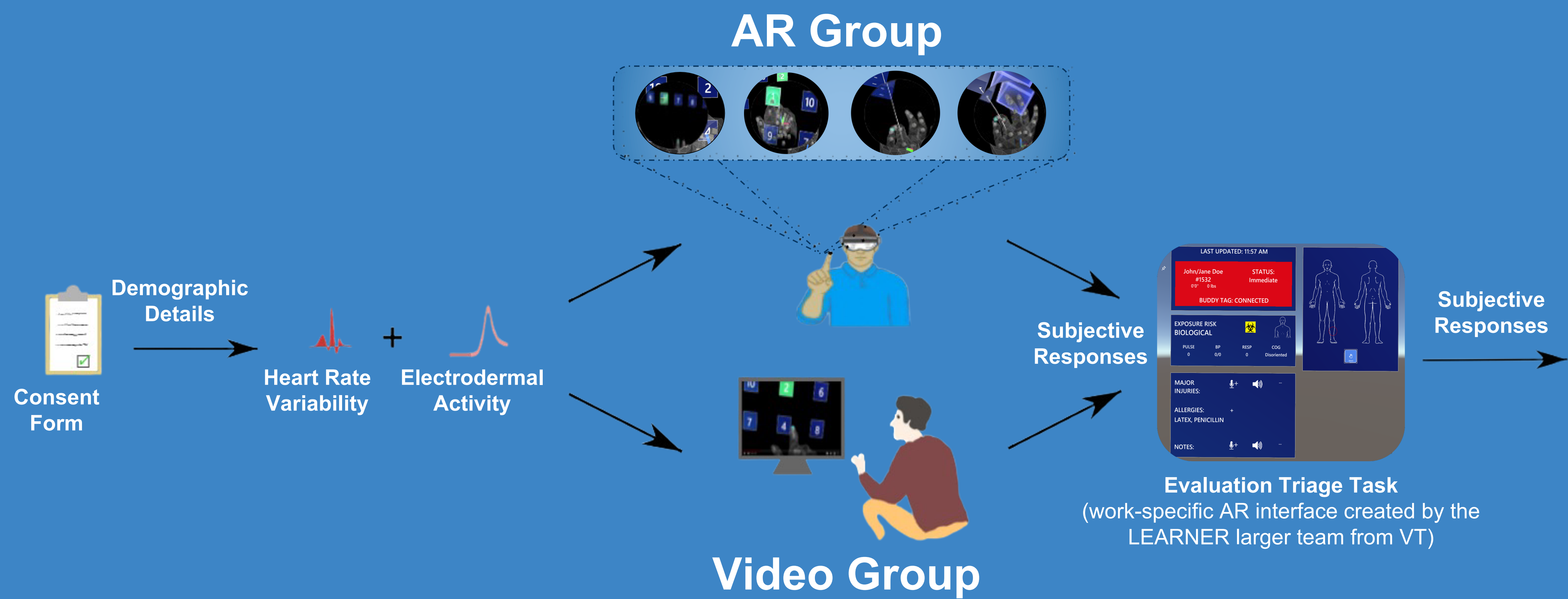
- No significant differences for AvgHR and LF/HF.
- In training, RMSSD was higher in AR than video during Poke (p=0.013) and Raycast (p=0.03).
- In evaluation, interaction effect of RMSSD on Scroll (p=0.03) but no significant differences for both group and gender.

• **EDA:** Collected data was not reliable enough to draw relevant conclusions.

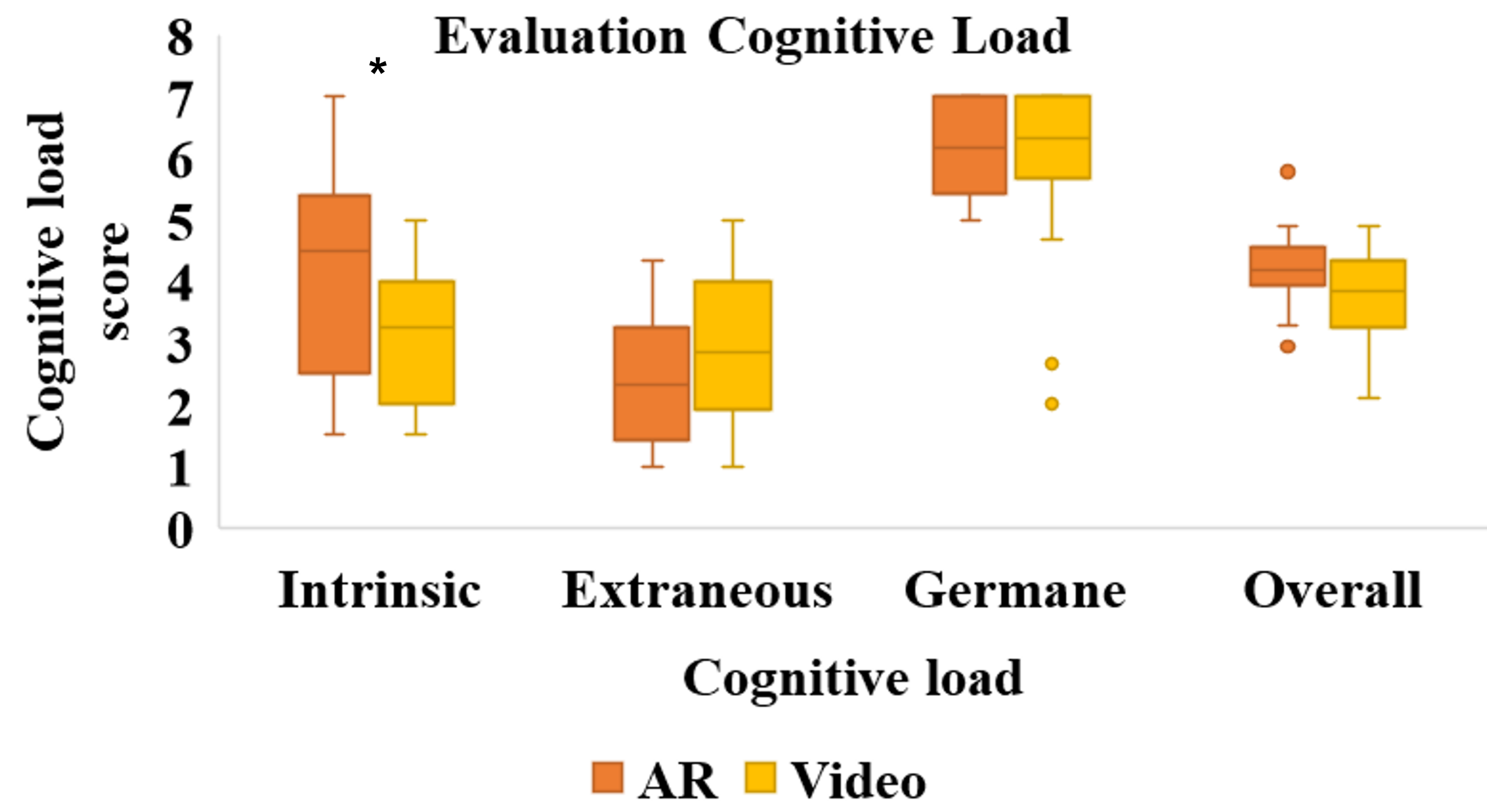


# LEARNER

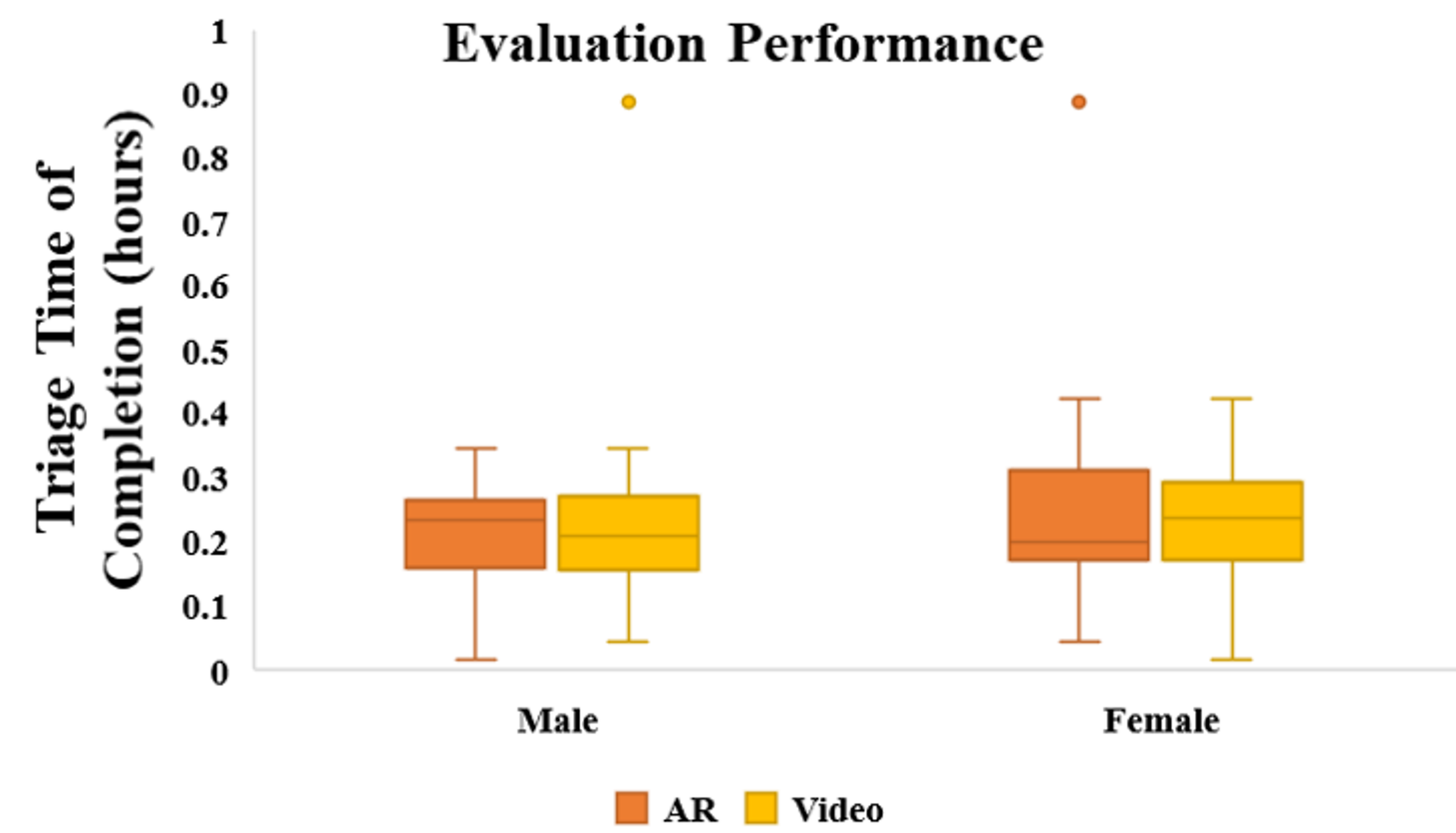
Performance was comparable across training modality and gender; however **AR-based training led to a higher user engagement, better immersion, and lower physiological load**



## EVALUATION



AR training resulted in higher intrinsic load, while extraneous and germane remained comparable between groups.



Performance, indicated by time of completion, was comparable across groups and gender, except for scrolling, where females performed better.

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