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

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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)
3. **Metrics:** Performance, subjective surveys, physiological responses
4. **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.

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

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

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