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## **Influence of Pedagogical Agent's Voice on Effort Ratings and Recall Performance**

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## INTRODUCTION

- The usage of computer-generated voices are increasingly common in daily life.
- Results were consistent to work by Craig & Schroeder (2017).
- Questions:
  - How does machine synthesized voice affect cognitive effort?
  - When placed under cognitive stress, how will participants perform in recall related tasks?

## METHOD

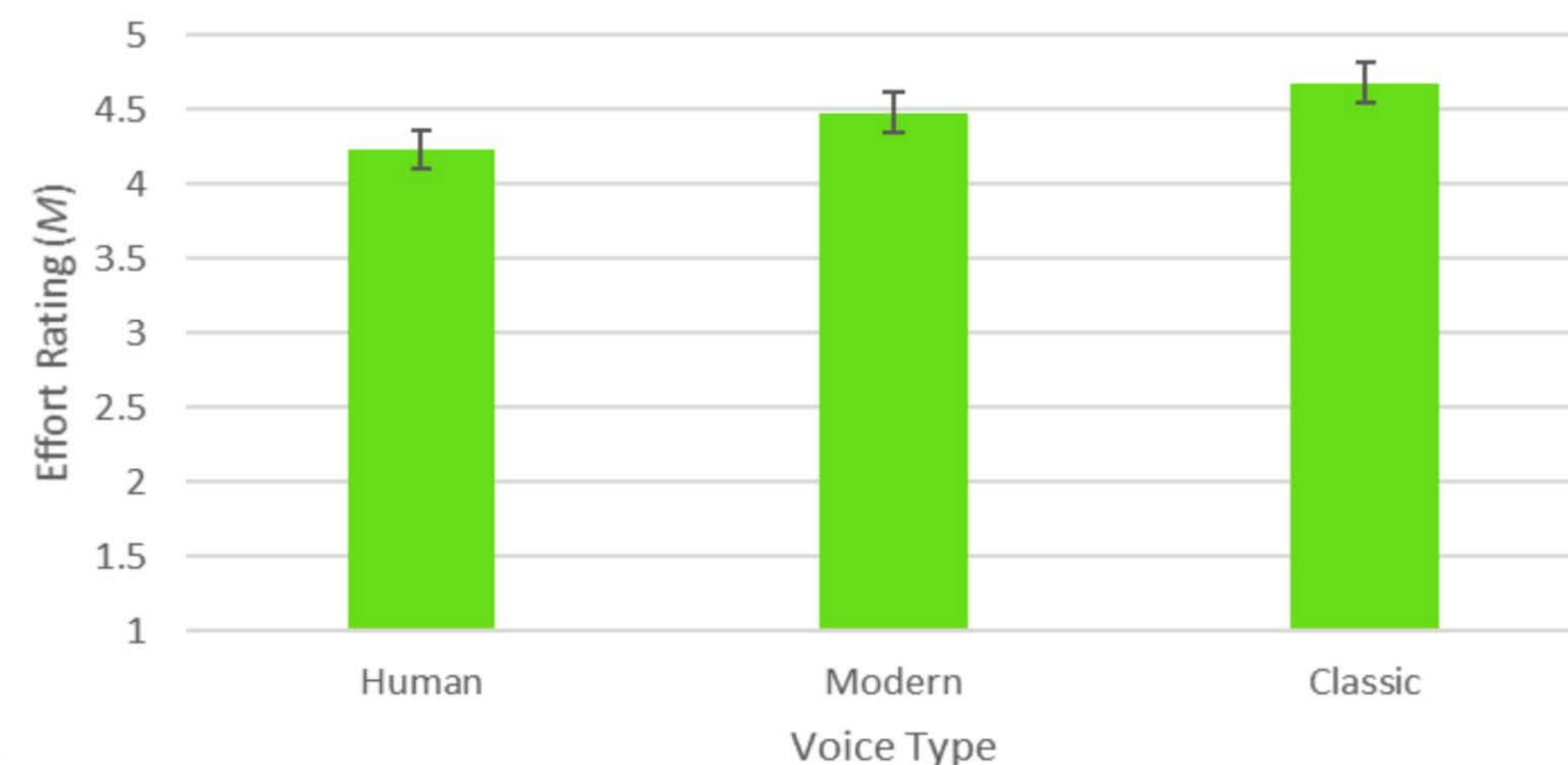
### Design & Materials (n=122)

Within-subjects design with three conditions: 1) Classic Synthesized, 2) Modern Synthesized, and 3) Human.

### Procedure

1. Training & acquainting with procedure and format
2. Memorize 5-digit number
3. Audio Lecture
  - Divided into 3 segments, each segment presented by a different stimulus (counterbalanced)
4. Recall 5-digit number
5. NASA-TLX
6. Recall Questions

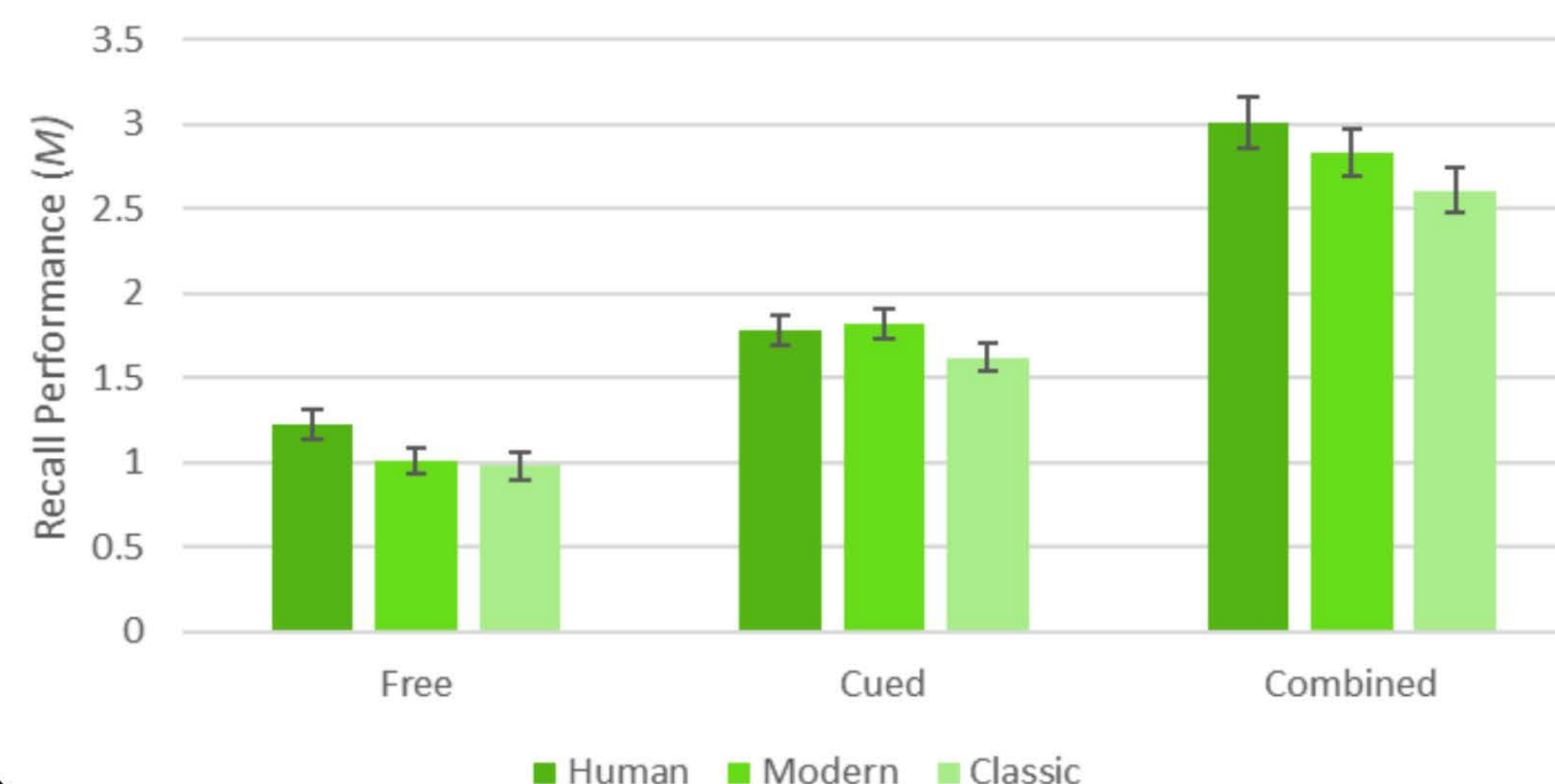
Participant Cognitive Effort Ratings



## RESULTS

1. **Human voice requires the least cognitive effort and best promotes learning when participants are placed under cognitive stress.**
2. Participants view the human voice as the least effortful over both synthesized voices in the absence of visual information.
3. **Cognitive stress** plays a key role in the relationship between voice type and recall performance.

Recall Performance



## DISCUSSION

A growing body of research supports the idea that the voice used to present information is important to learning.

### Recommendations:

1. Use a human voice for difficult audio educational materials
2. In some low-effort situations, a machine voice can be used and still achieve the same results as the human voice
3. If possible, give learners the option to choose the voice type (such as when deciding on textbook narration)

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