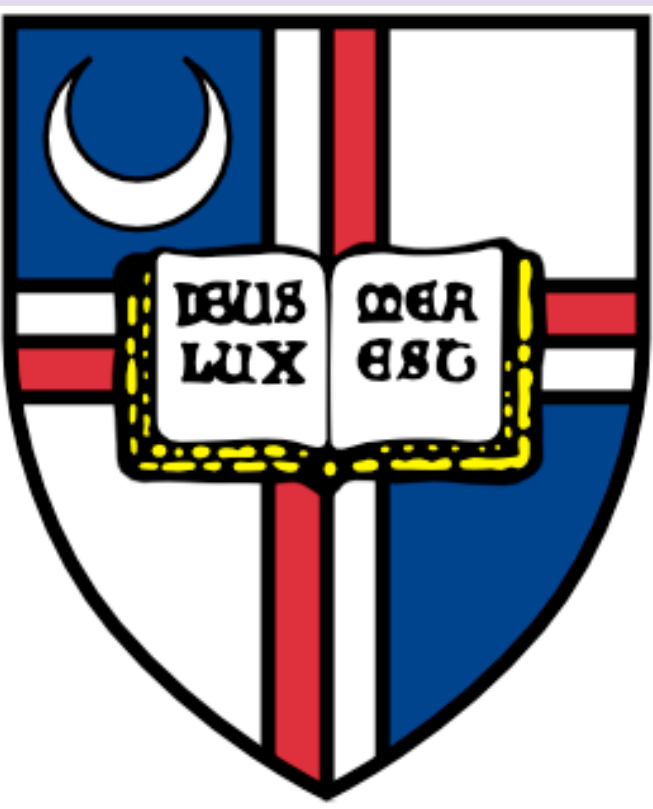




EFFECTS OF A SECONDARY TASK ON IMPLICIT LEARNING OF HIGHER ORDER REGULARITIES: IMPLICATIONS FOR AGING

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Abstract

The main goals of this experiment were to study the effects of a secondary task on implicit learning of sequential patterns, and to determine the extent to which such manipulation mimics the effects of aging on learning. We tested 24 young (18-22 years) adults on an Alternating Serial Reaction Time (ASRT) task, in which predictable pattern events alternated with random, unpredictable ones (e.g., 1 r 2 r 3 r). Implicit learning was measured by the difference in response time and accuracy between pattern and random trials. For the secondary task, participants were given a Digit Span test, in which they were asked to remember a string of digits while performing the ASRT task, and to report them back to the experimenter at the end of the block. We compared participants in the Dual condition with 24 young and 24 elderly participants in a Single condition from another experiment, in which they only performed the ASRT task. Young participants in the Dual condition who performed well on the secondary task showed less pattern learning compared to young people in the Single condition. On the other hand, they revealed a similar amount of learning when compared with the elderly group in the Single condition. These findings suggest that similar cognitive processes, such as working memory deficits, might contribute to the learning deficits observed in dual-task conditions and in aging, and hold promise for using dual-task studies to understand the mechanisms of aging.

Questions

- Does a dual task hinder implicit learning of higher-order sequences in young people?
- Does a dual task mimic the effects of aging on learning of higher-order regularities?
- What mechanisms underlie age deficits in learning higher-order regularities, and what can be learned from dual-task studies?

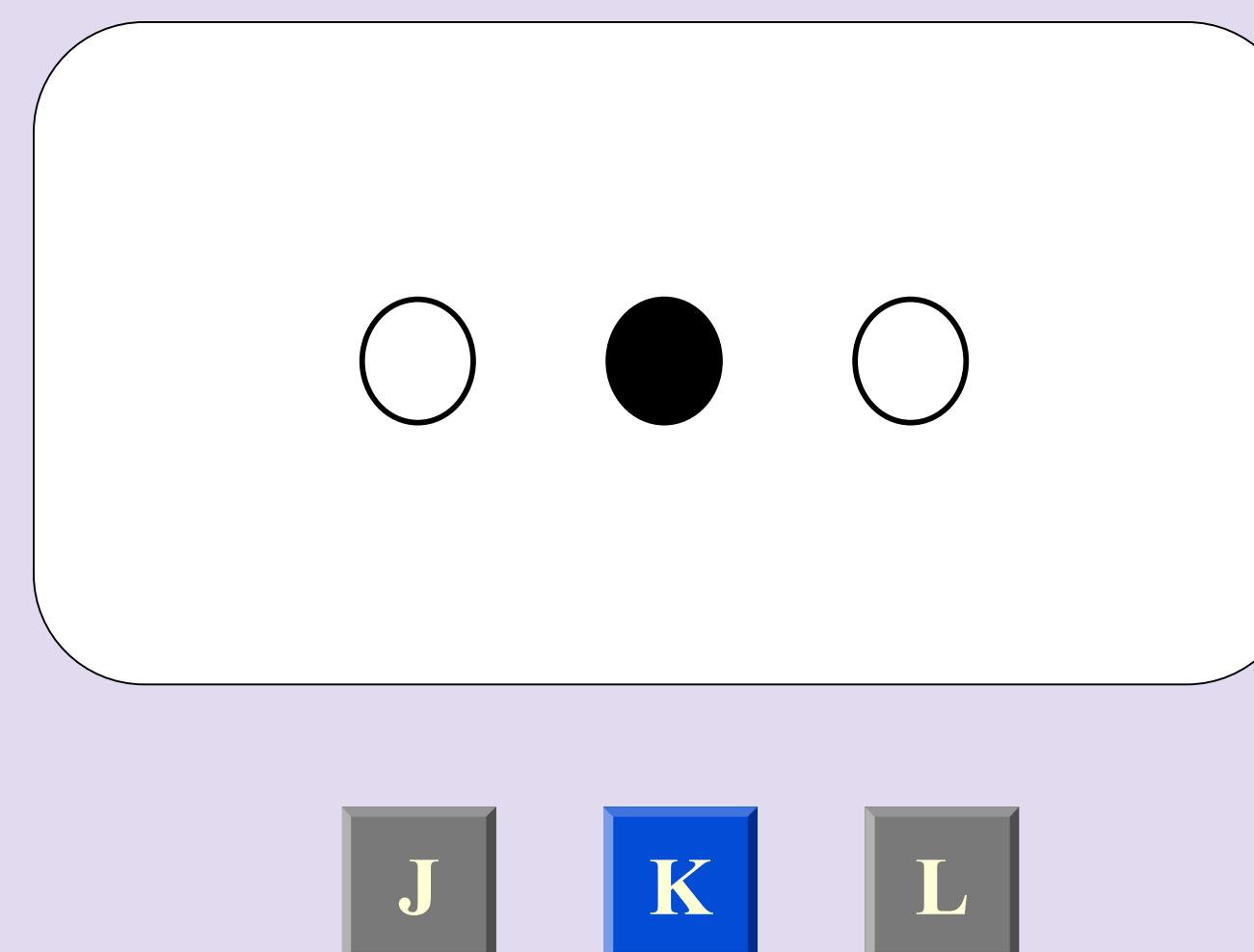
Participants

- **Dual Task Group:**
 - Young (18-22 years)
 - N = 24
- **Single Task Groups (from another experiment):**
 - **Young:** 24 participants (18-22 years)
 - **Older:** 24 participants (65+)

Method

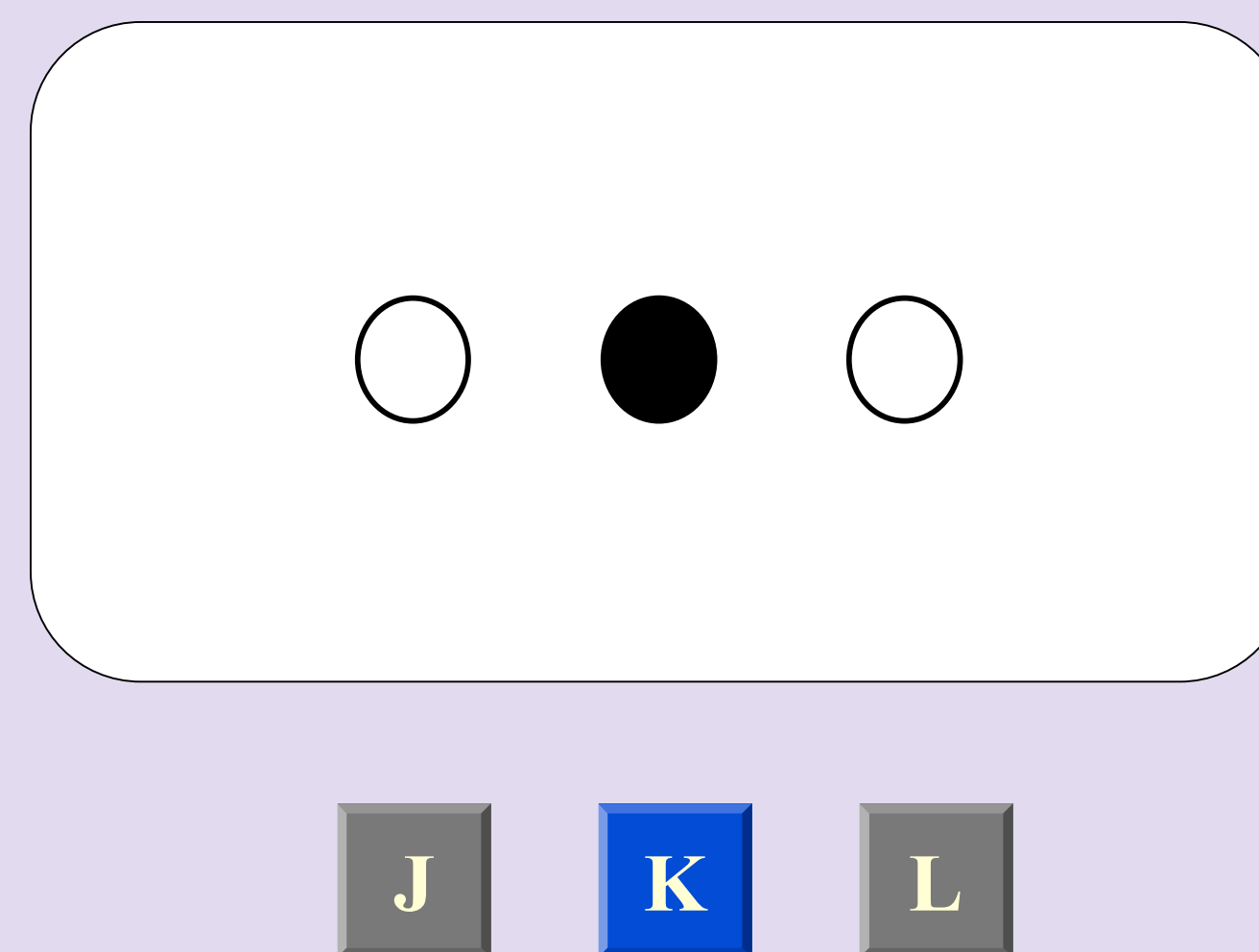
SINGLE TASK CONDITION:

ASRT TASK

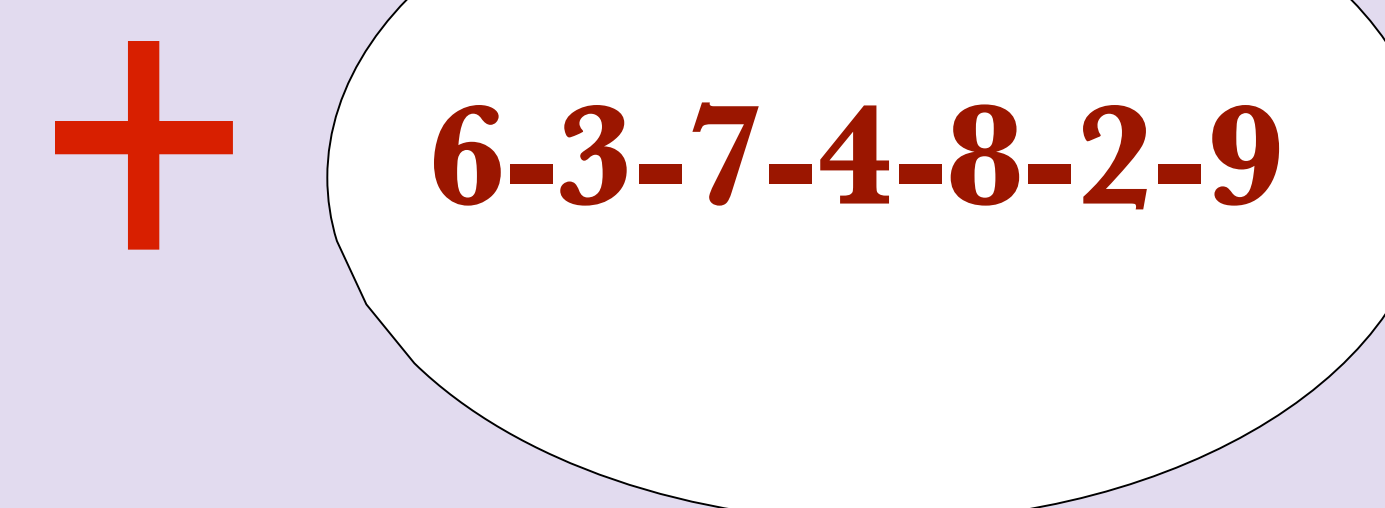


DUAL TASK CONDITION:

ASRT TASK



DIGIT SPAN TEST



Measures of Learning:

ASRT task:

Trial-Type Effect: difference in performance between pattern and random trials on RT and accuracy measures.

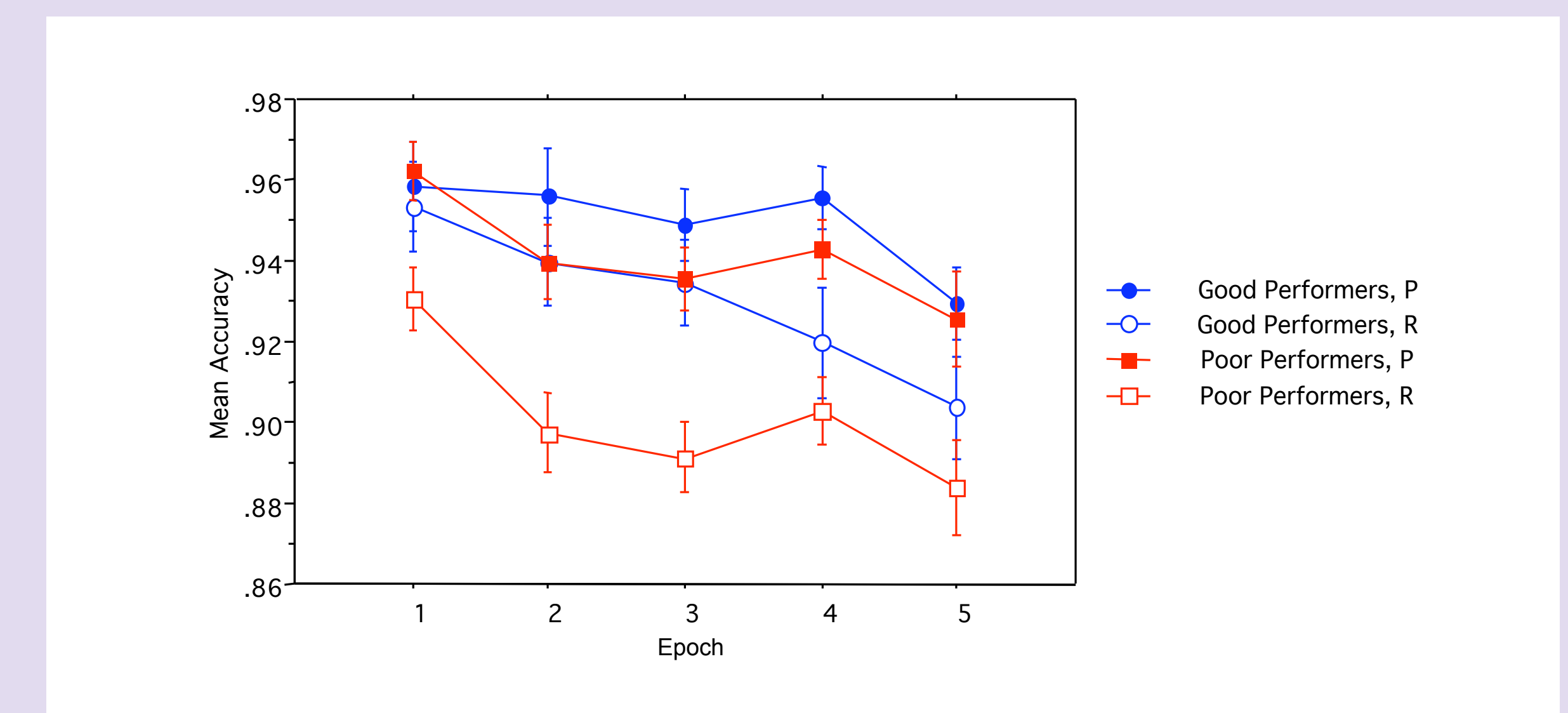
Dual task:

Good Performers: those who meet 90% criterion on the Digit Span test

Poor Performers: those who do not meet the 90% criterion on the Digit Span test

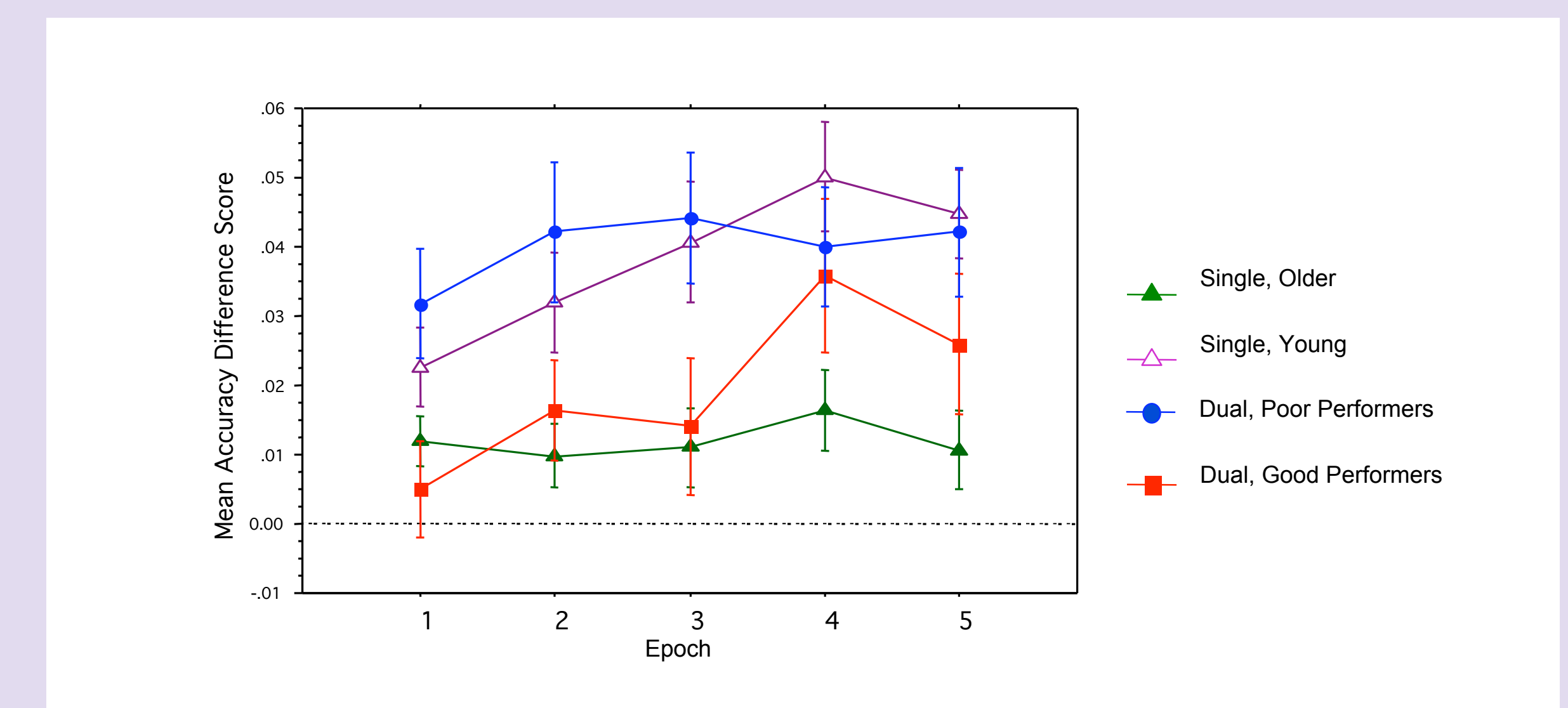
Results #1:

Pattern Learning Under the Dual Task Condition



Results #2:

Dual Task vs. Single Task Young & Older Groups



Conclusions

- ❖ Participants who performed well on the secondary task showed smaller pattern learning compared to those who did not.
- ❖ Equivalent amounts of pattern learning were observed for older adults and for younger adults who performed well on the secondary task.
 - These findings implicate a working memory role in higher-order learning and support a simultaneity theory of aging.

Gerontological Society of America, San Diego, CA, November 21-25, 2003
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Supported by NIA Grant R37 AG15450 and
Predoctoral Fellowship F31 AG05919