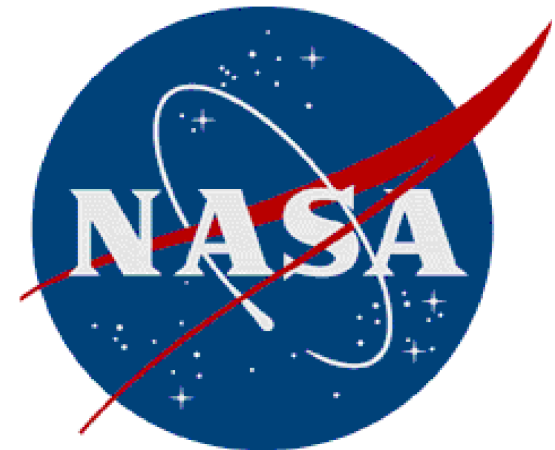


Training, Retention, and Transfer of Data Entry Perceptual and Motor Processes Over Short and Long Retention Intervals

**Alice F. Healy, James A. Kole,
Vivian I. Schneider,
and Immanuel Barshi**



SPECIFICITY

Demonstrations of Specificity

Healy, Wohldmann, Parker, & Bourne (2005)

Healy, Wohldmann, Sutton, & Bourne (2006)

Theories of Specificity

Thorndike (1906)

Identical Elements

Tulving & Thomson (1973)

Encoding Specificity

Morris, Bransford, & Franks (1977)

Transfer Appropriate Processing

Healy, Wohldmann, & Bourne (2005)

Procedural Reinstatement

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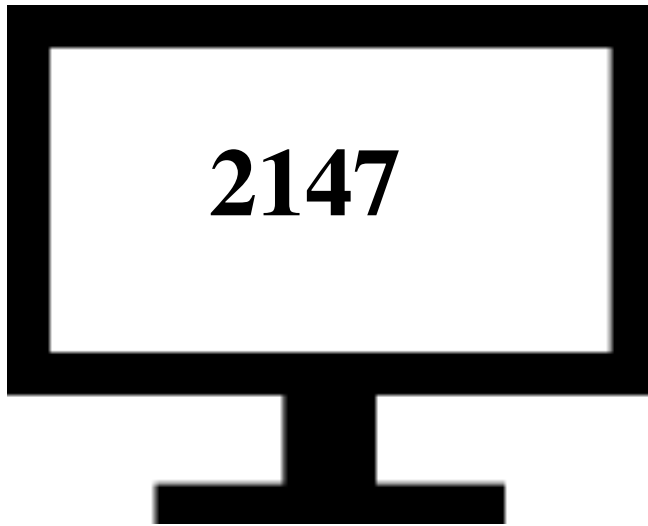
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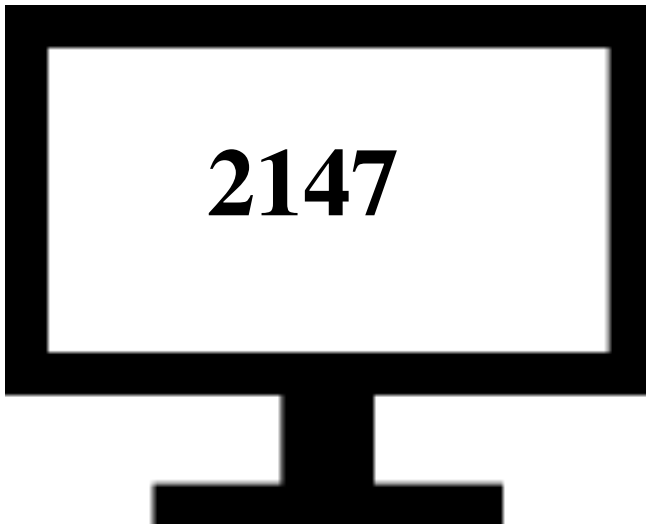
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Procedural Reinstatement

Standard Data Entry Task

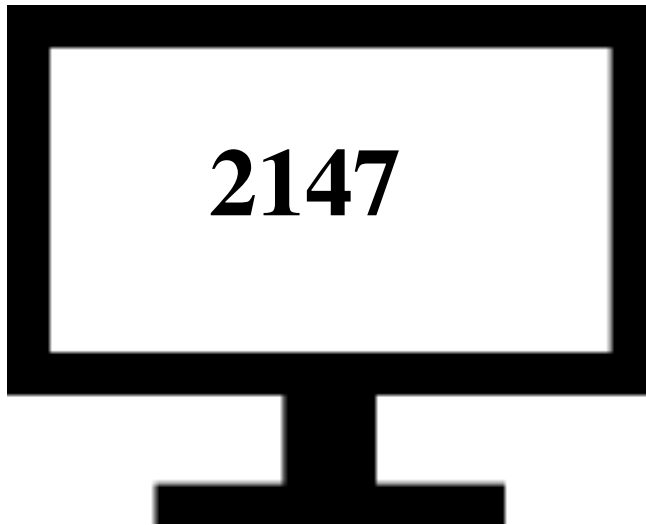


Standard Data Entry Task



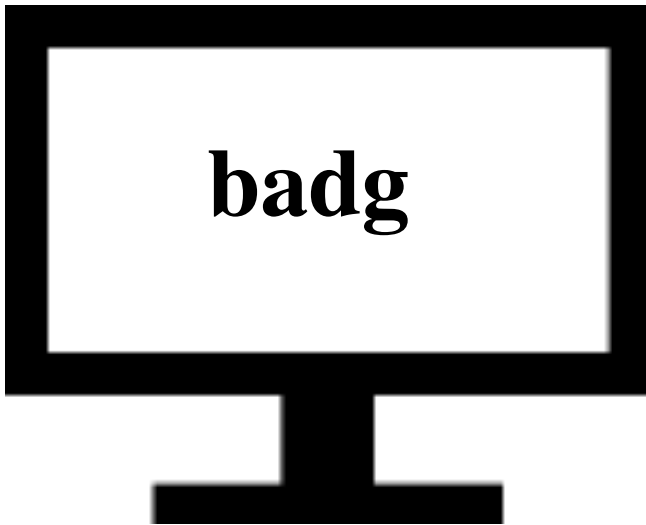
Left-Hand Variant

Different Motoric Processes,
Same Perceptual Processes



Code Variant

Different Perceptual Processes,
Same Motoric Processes



METHOD

Test Stimuli

Old, New

Repetition Priming

Old faster than New

Repetition Priming for **Standard Task**

Reflects Specificity of Training

Repetition Priming for **Left-Hand Task**

Implies Perceptual Transfer

Repetition Priming for **Code Task**

Implies Motoric Transfer

MATERIALS

Training

Standard task

2 days

3 blocks of 100 trials both days

Test

100 trials of standard variant

100 trials of novel variant (left hand or code)

50 old, 50 new

Change-hand test

standard variant followed by left-hand variant

Change-stimuli test

standard variant followed by code variant

MATERIALS

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DESIGN

Within-subject variables (Training)

Day

(Day 1, Day 2)

Block

(Block 1, Block 2, Block 3)

Within-subject variables (Test)

Task

(standard, left-hand) or (standard, code)

Trial type

(new, old)

Dependent variables

Execution time (average time to type the second, third, and fourth digits) for correct trials

Initiation time (time to type the first digit) for correct trials

EXPERIMENT 1 ($n = 24$)

Training

2 days (with 48 hours in between)
standard task (right hand, numerals)
3 blocks, 100 trials per block, each day

Testing

Change-hand test (20 min after training)
100 trials **standard** task (right hand, numerals)
100 trials **left-hand** task (left hand, numerals)

Change-stimuli test (2 days after training)
100 trials **standard** task (right hand, numerals)
100 trials **code** task (right hand, letters)

EXPERIMENT 1 ($n = 24$)

Training

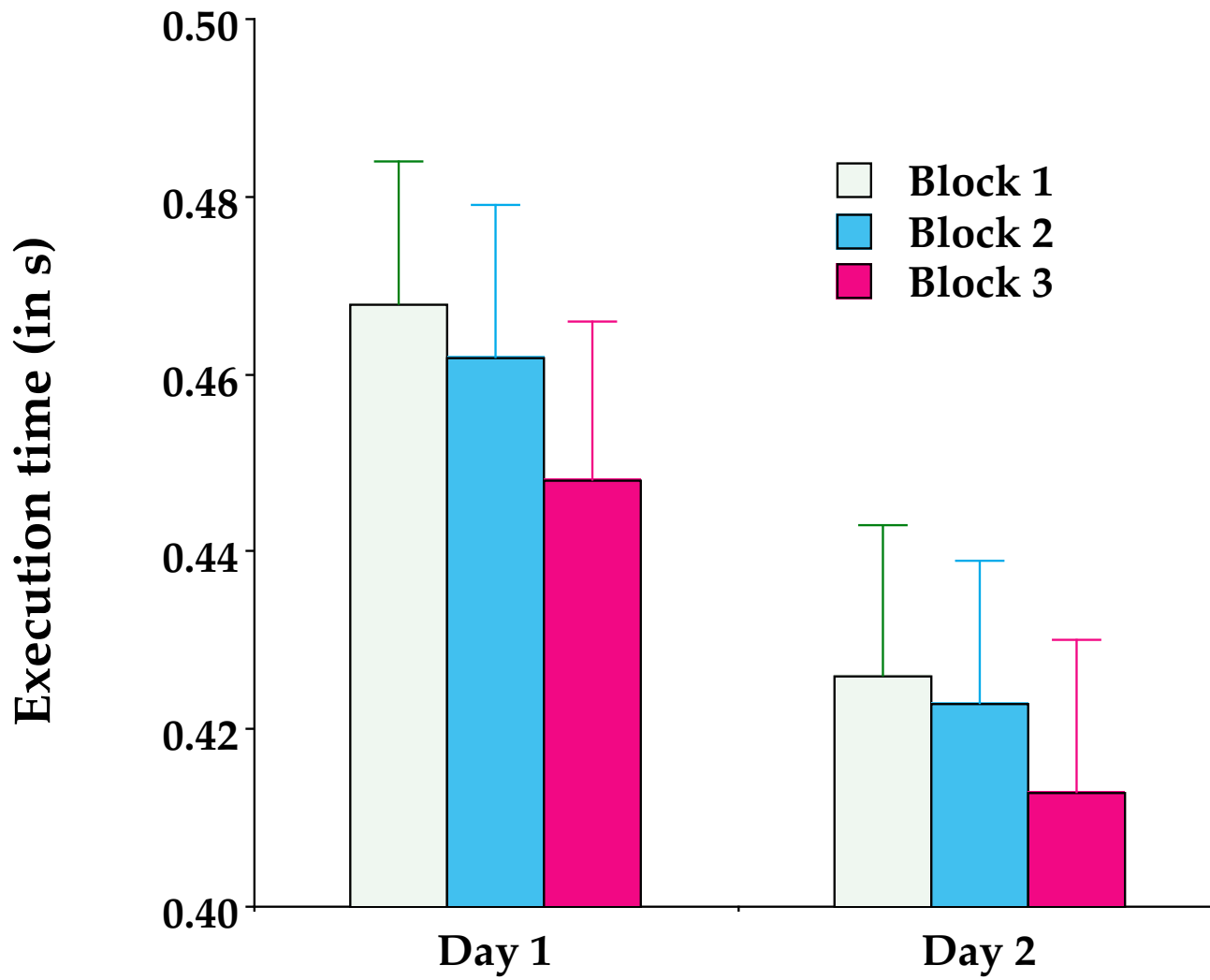
2 days (with 48 hours in between)
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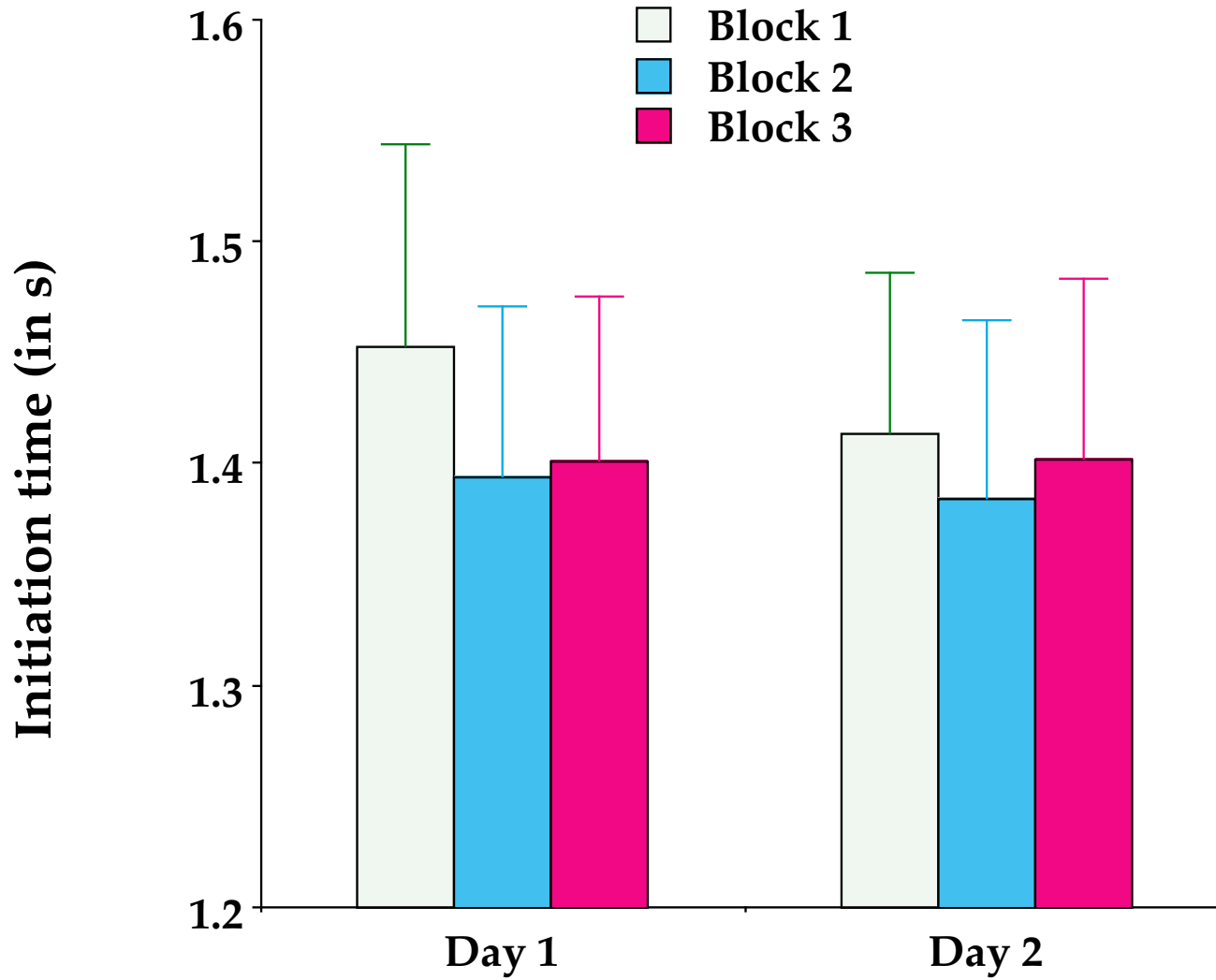
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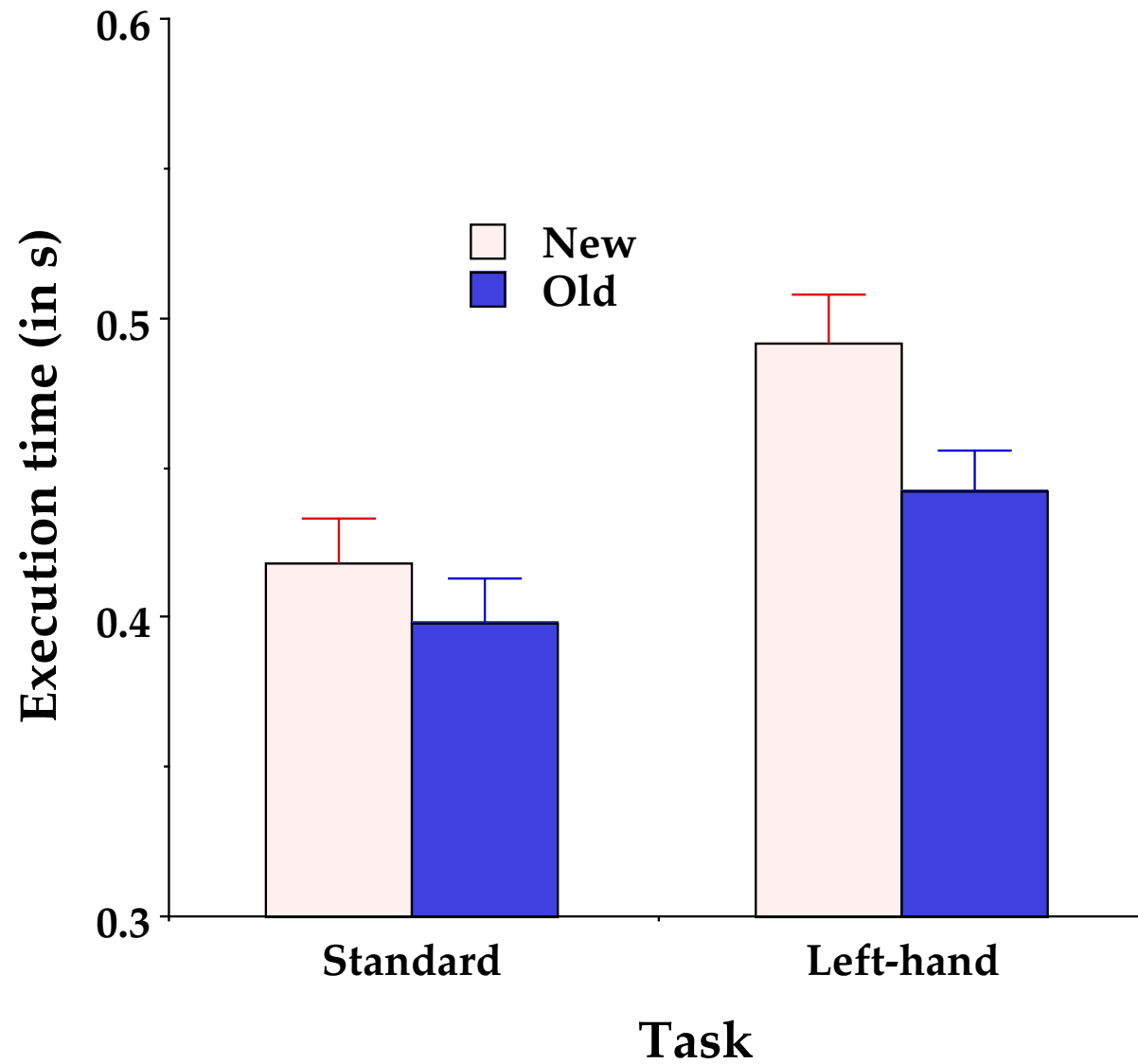
Training



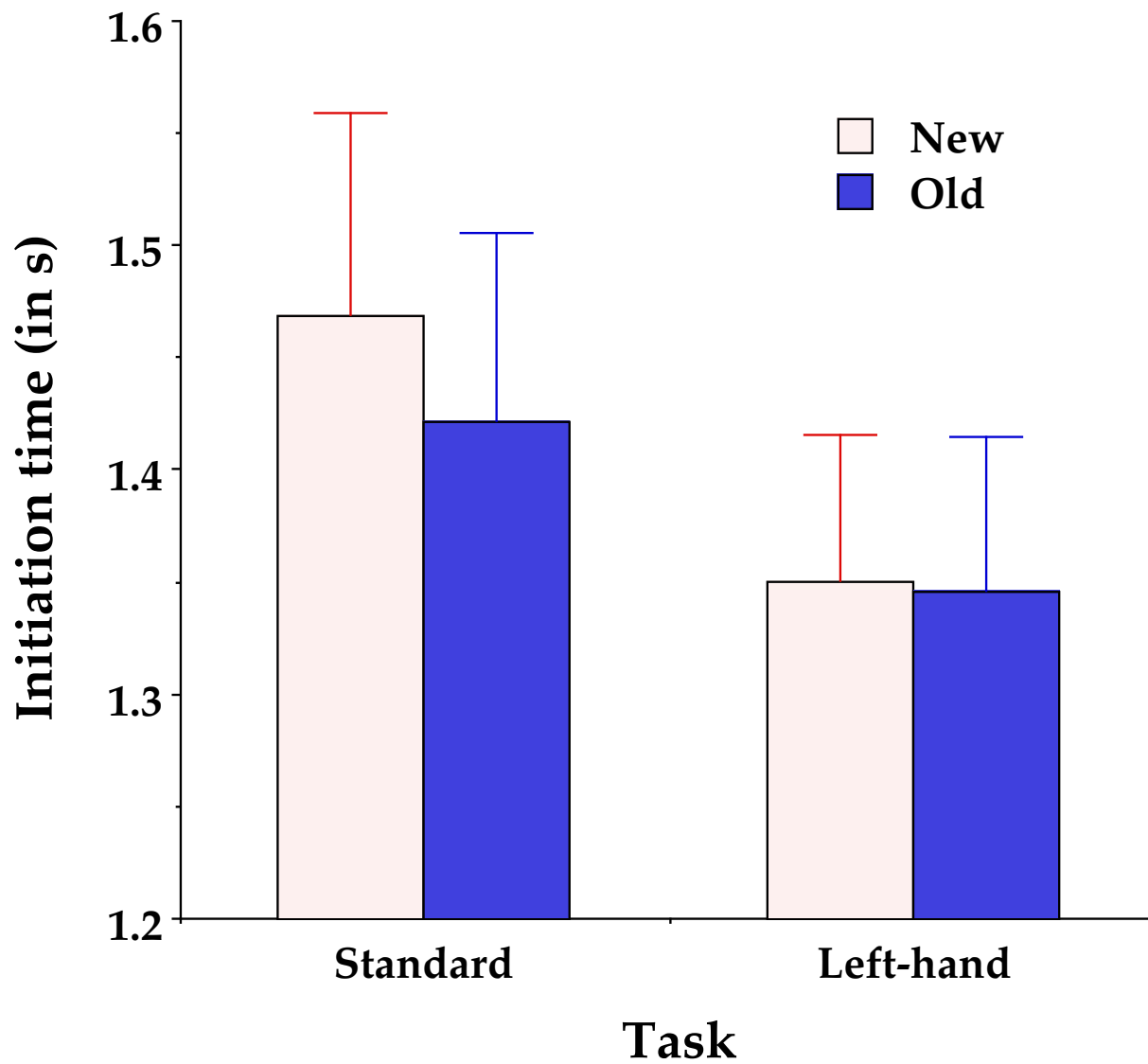
Training



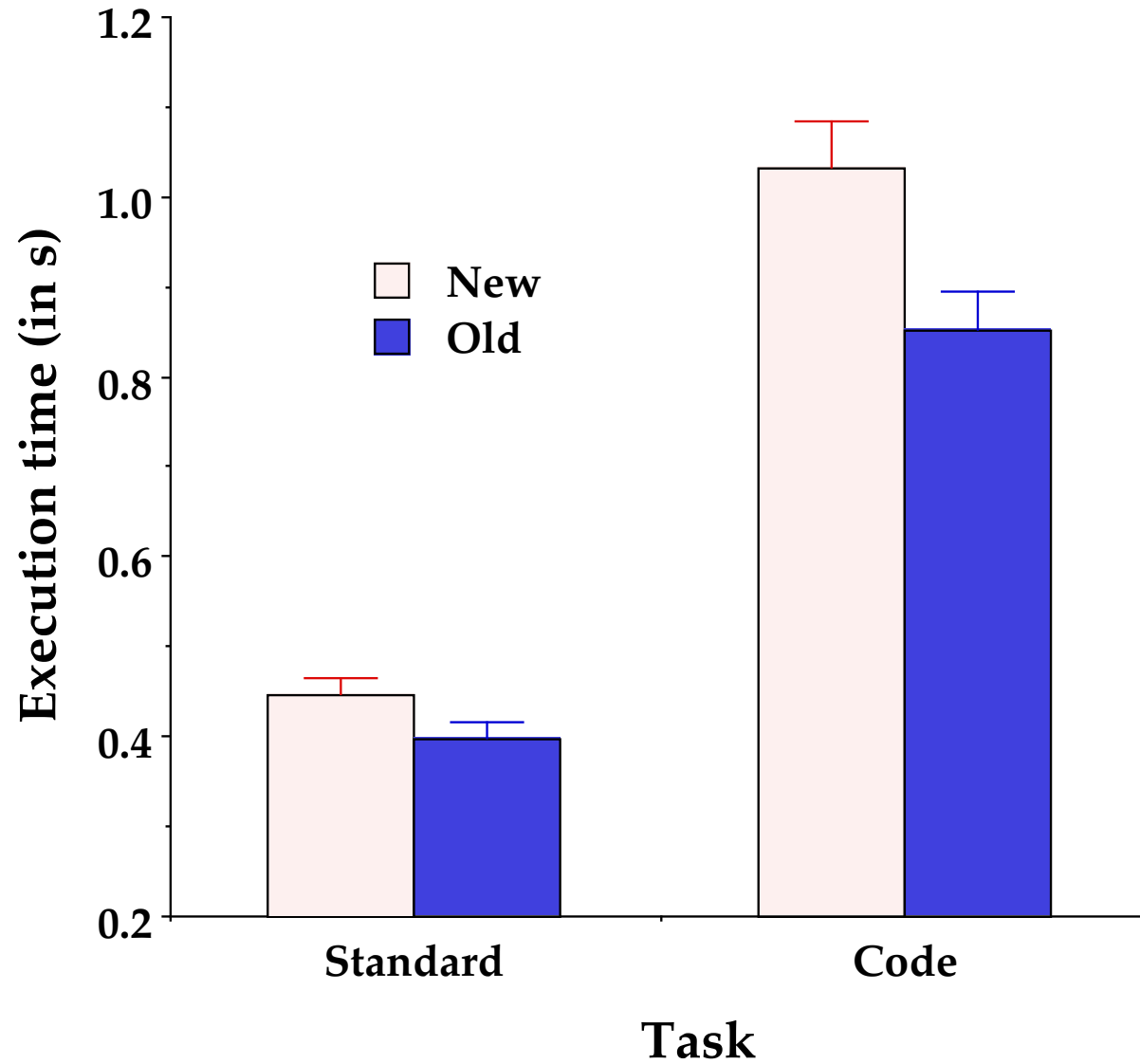
Change-Hand Test



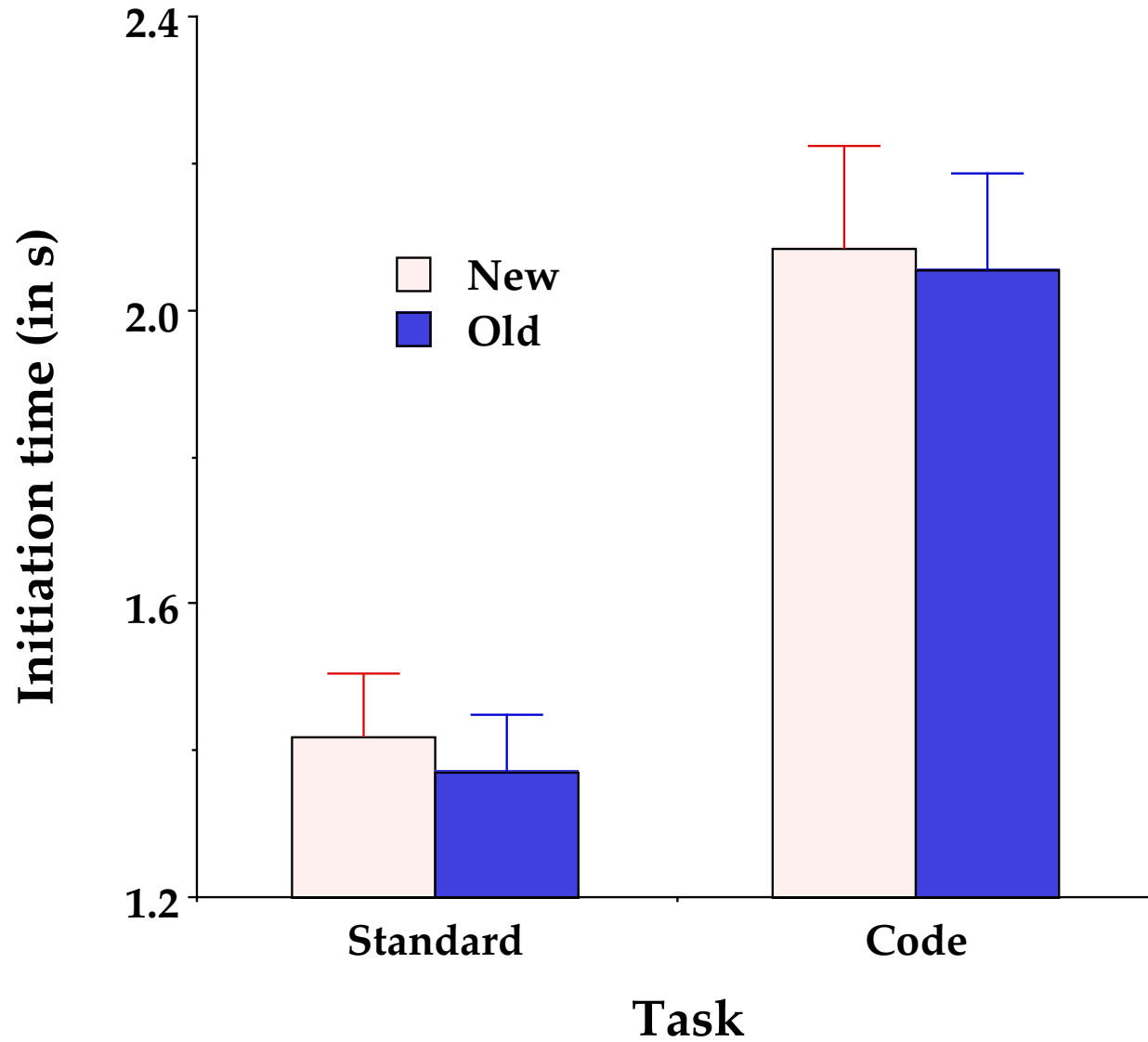
Change-Hand Test



Change-Stimuli Test



Change-Stimuli Test



EXPERIMENT 2 ($n = 26$)

Training

2 days (with 3 months in between)

standard task (right hand, numerals)

3 blocks, 100 trials per block, each day

Testing

Change-hand test (6 months after training)

100 trials **standard** task

100 trials **left-hand** task (left hand, numerals)

Change-stimuli test (8 months after training)

100 trials **standard** task

100 trials **code** task (right hand, letters)

EXPERIMENT 2 ($n = 26$)

Training

2 days (with 3 months in between)

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Change-hand test (6 months after training)

100 trials **standard** task

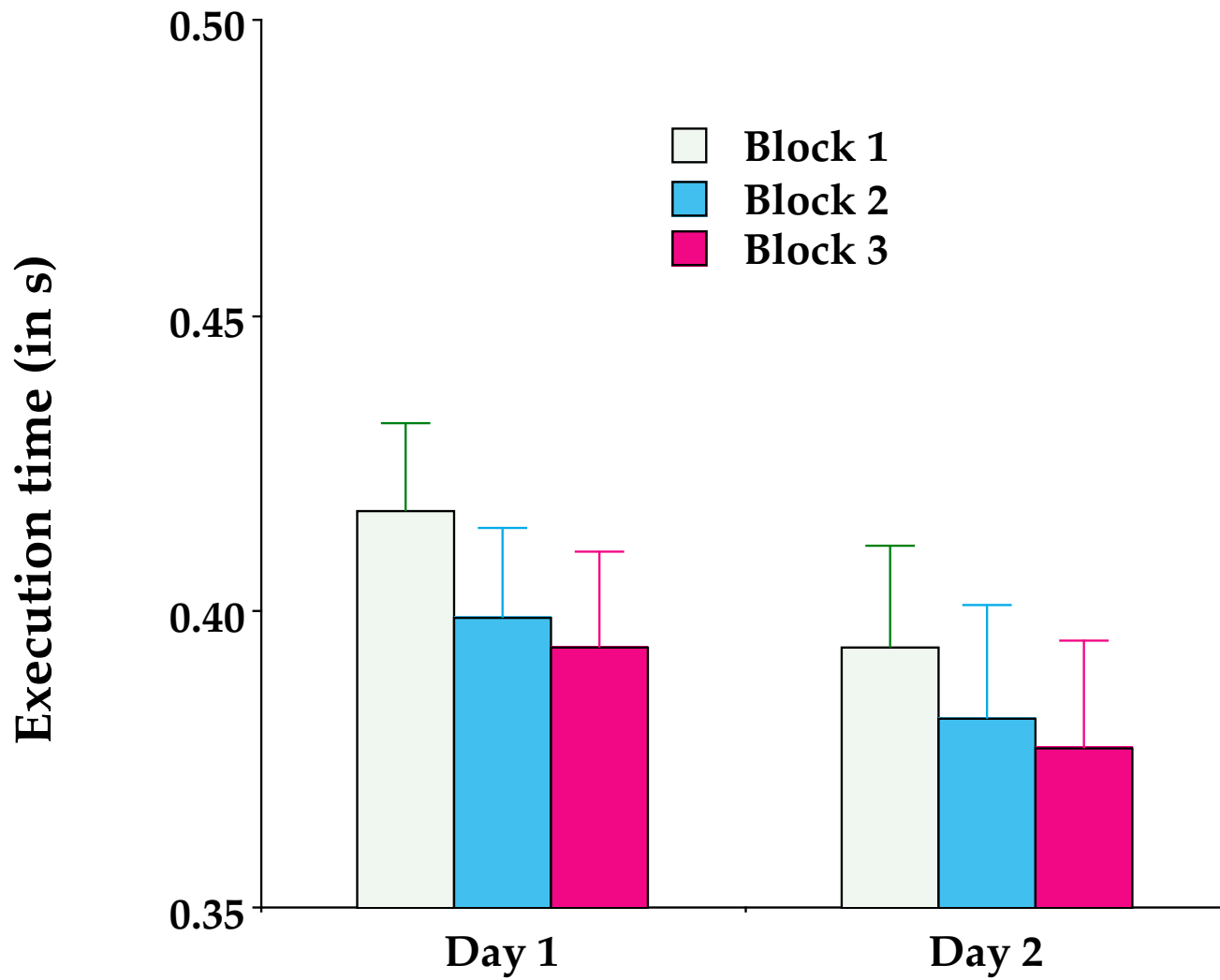
100 trials **left-hand** task (left hand, numerals)

Change-stimuli test (8 months after training)

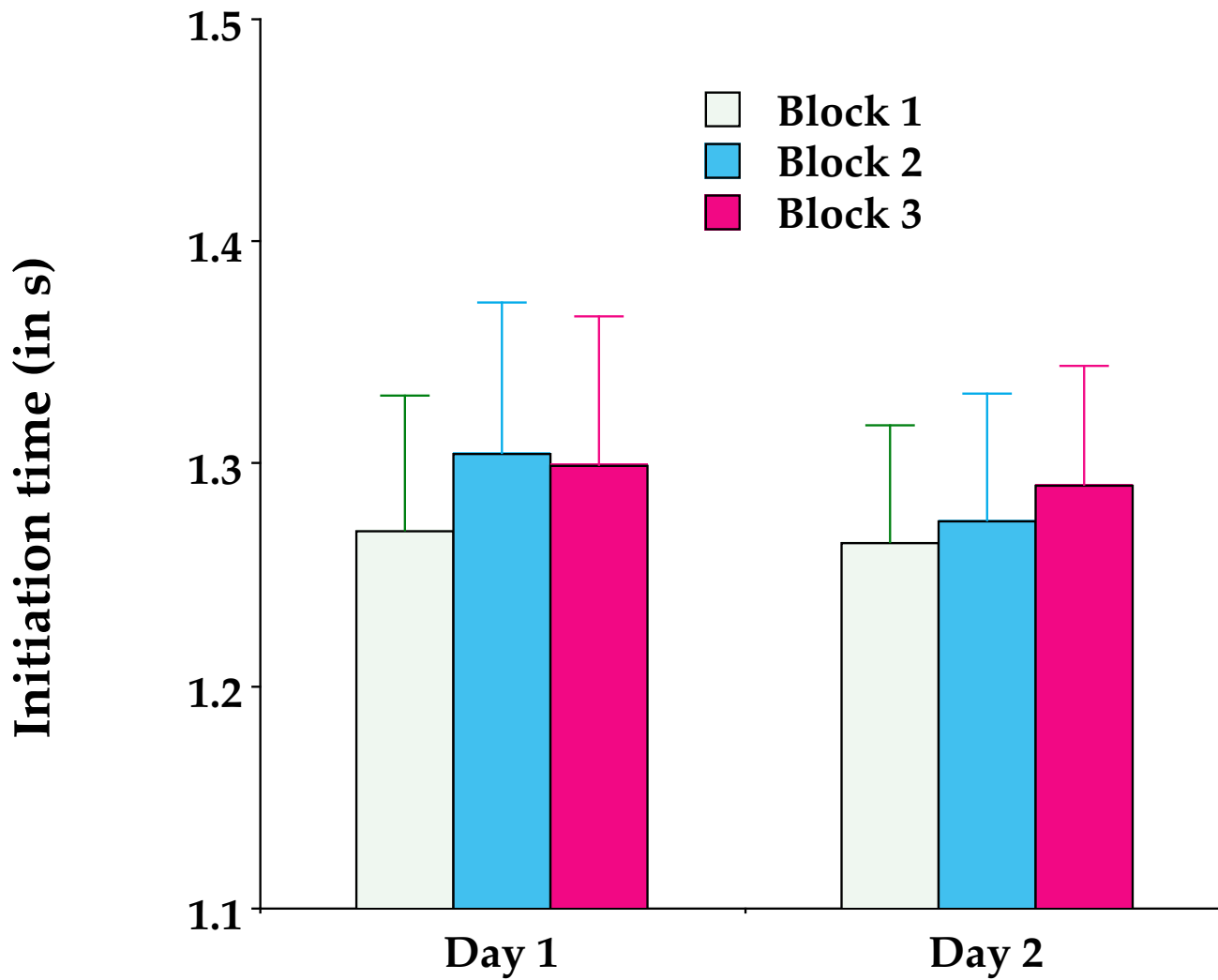
100 trials **standard** task

100 trials **code** task (right hand, letters)

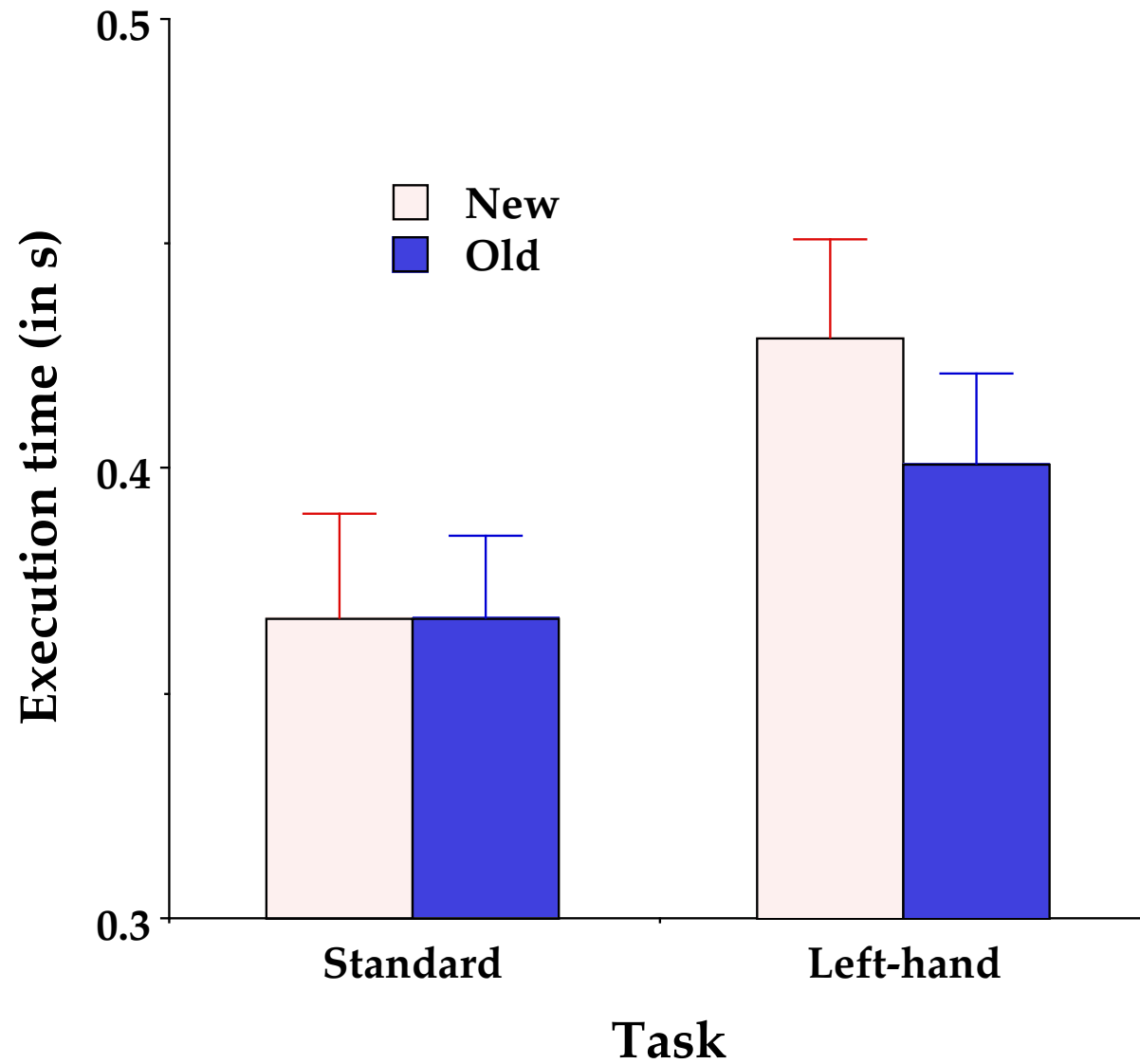
Training



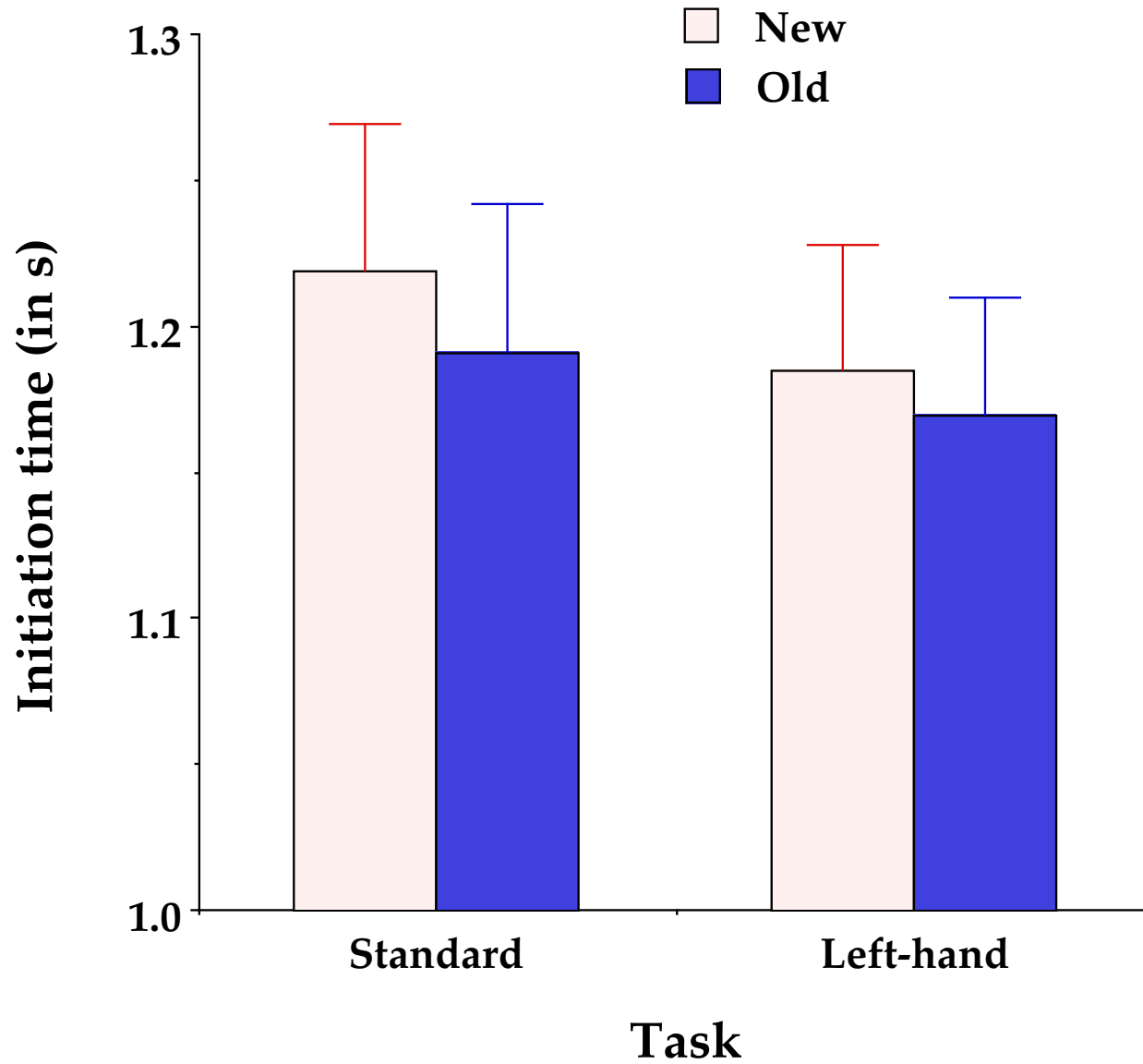
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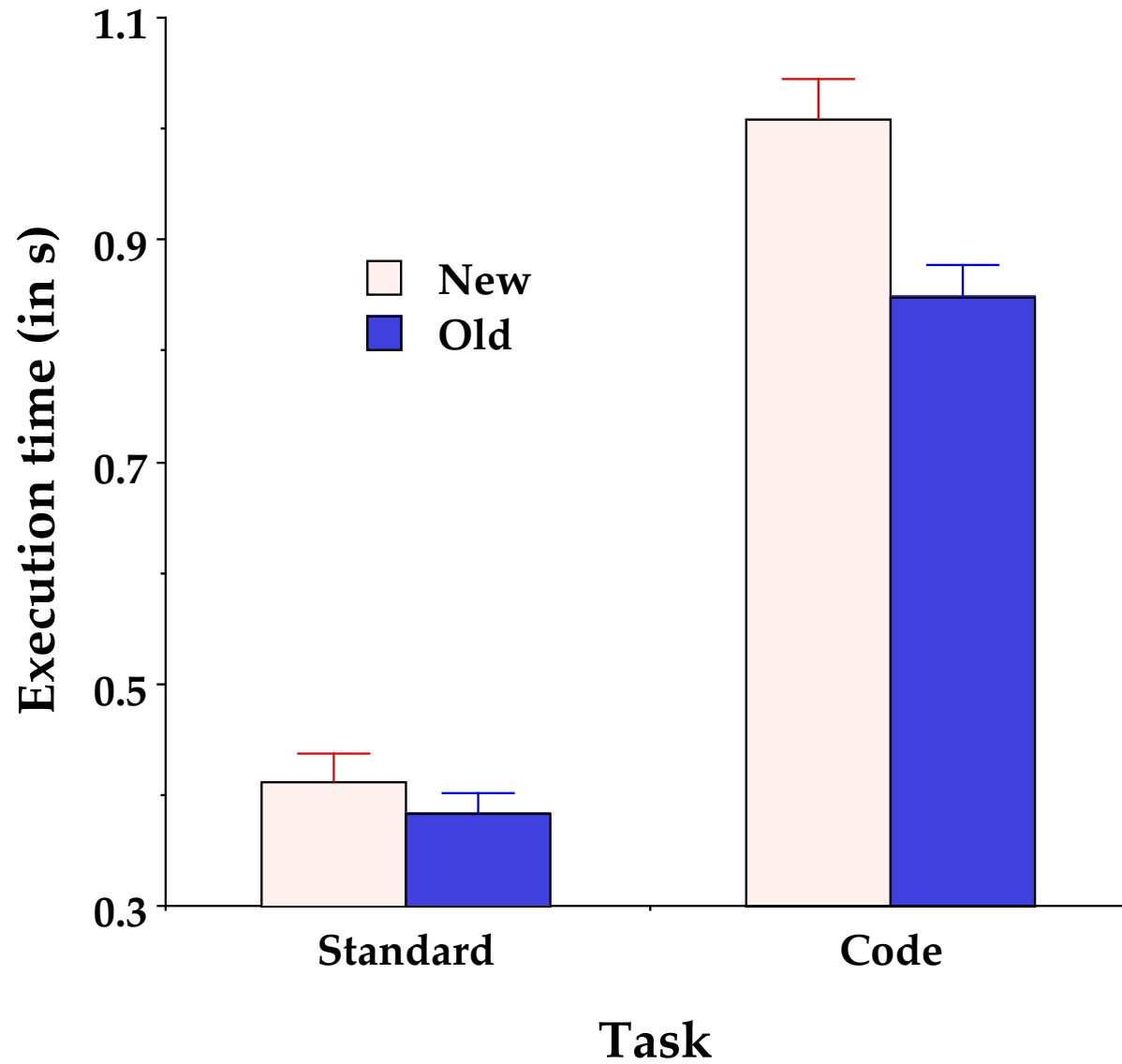
Change-Hand Test



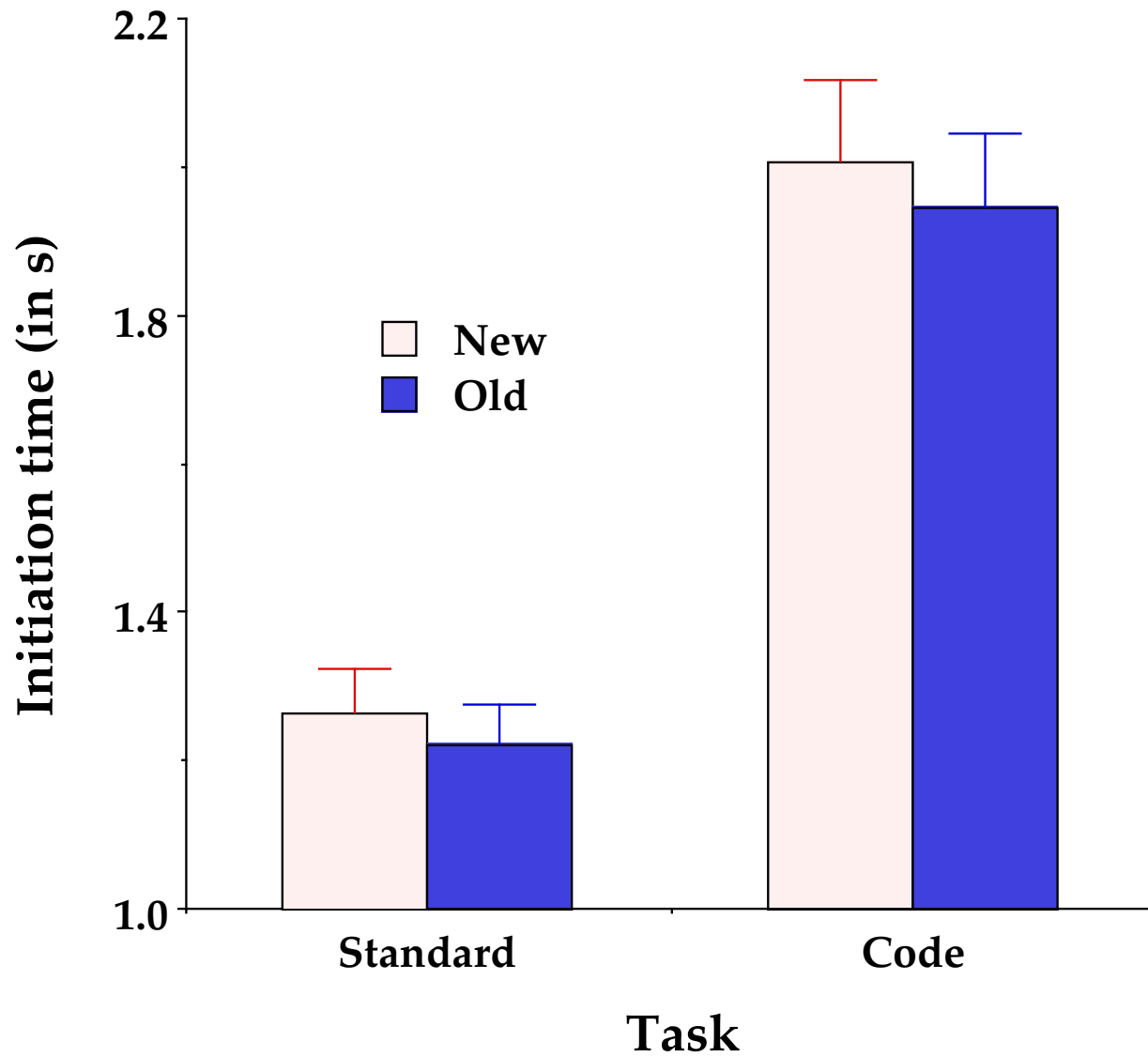
Change-Hand Test



Change-Stimuli Test



Change-Stimuli Test



SUMMARY

Specificity of training

Repetition priming for standard task

Generalizability of training

Repetition priming for left-hand and code tasks

Transfer of **perceptual processes** in left-hand task

Transfer of **motoric processes** in code task

CONCLUSIONS

Retention Intervals

6 & 8 months in Experiment 2

Practical Implications

Benefit from training

**despite long retention intervals and
changes in perceptual or motoric aspects**

Simulators and other training devices

highly effective without perfect fidelity

CONCLUSIONS

Retention Intervals

6 & 8 months in Experiment 2

Practical Implications

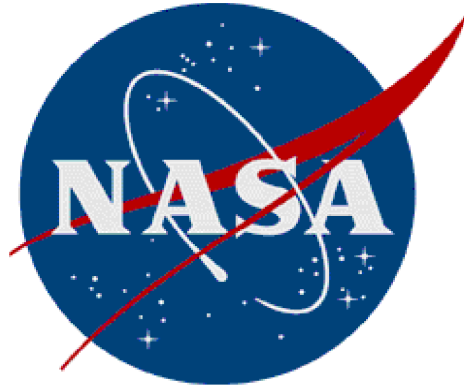
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ACKNOWLEDGMENTS



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Memory Lab
UNIVERSITY of PENNSYLVANIA

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