

THE INFLUENCE OF PERCEIVED MENTAL EFFORT AND FAMILIARITY OF STUDY STRATEGIES ON SELF- REGULATED LEARNING CHOICES



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Cognitive Talk Series

Background: Metacognition & Learning



Effective learning
requires good study
strategy decisions!

Background: Self-regulated Learning



The Cycle of Self-Regulated Learning

Showing steps students can take throughout the process

Image by Karin Kirk

Background: Metacognition & Learning

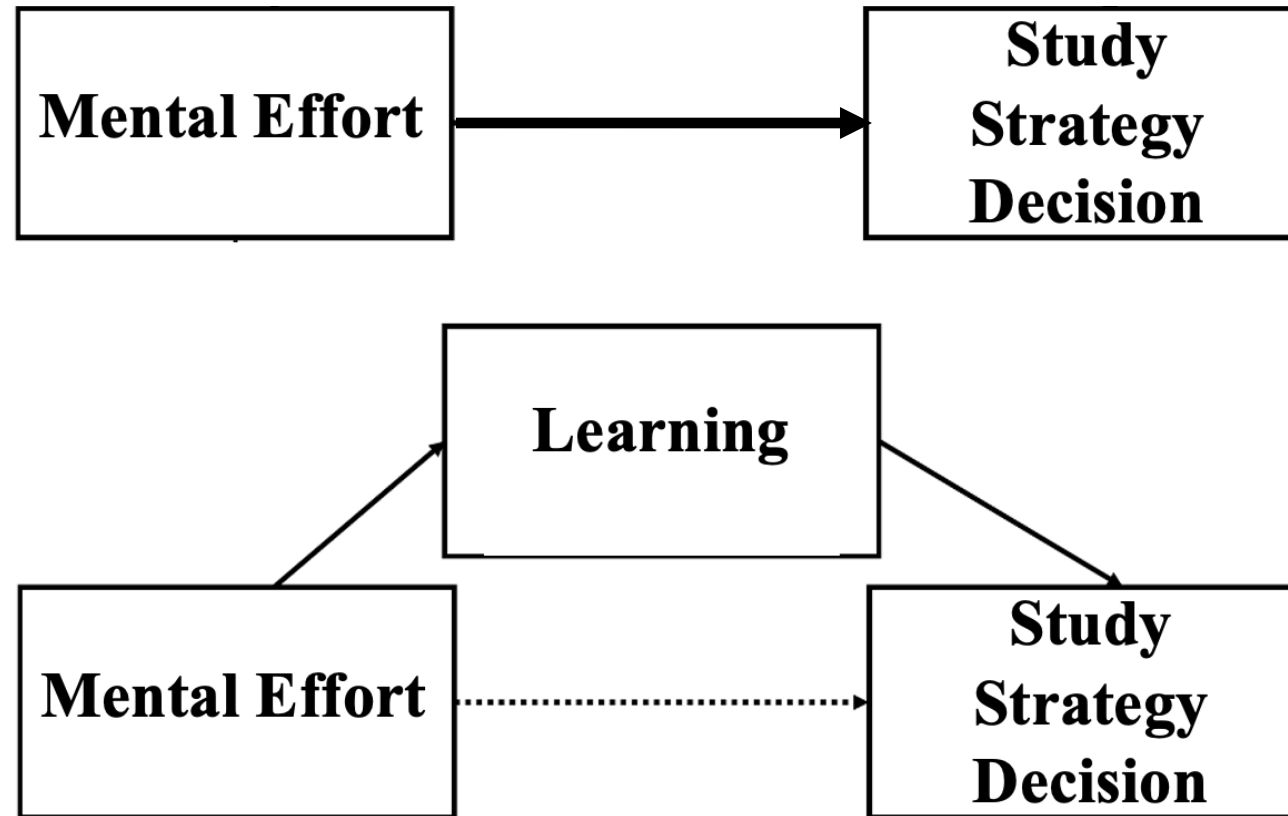


Effective learning
requires good study
strategy decisions!

Learners are rarely
taught how to learn
and often choose
suboptimal study
strategies.

Strategies effective for
learning often require
more initial effort, but
learners often
misinterpret this effort
as indicative of poor
learning.

Background: Misinterpreted-effort Model



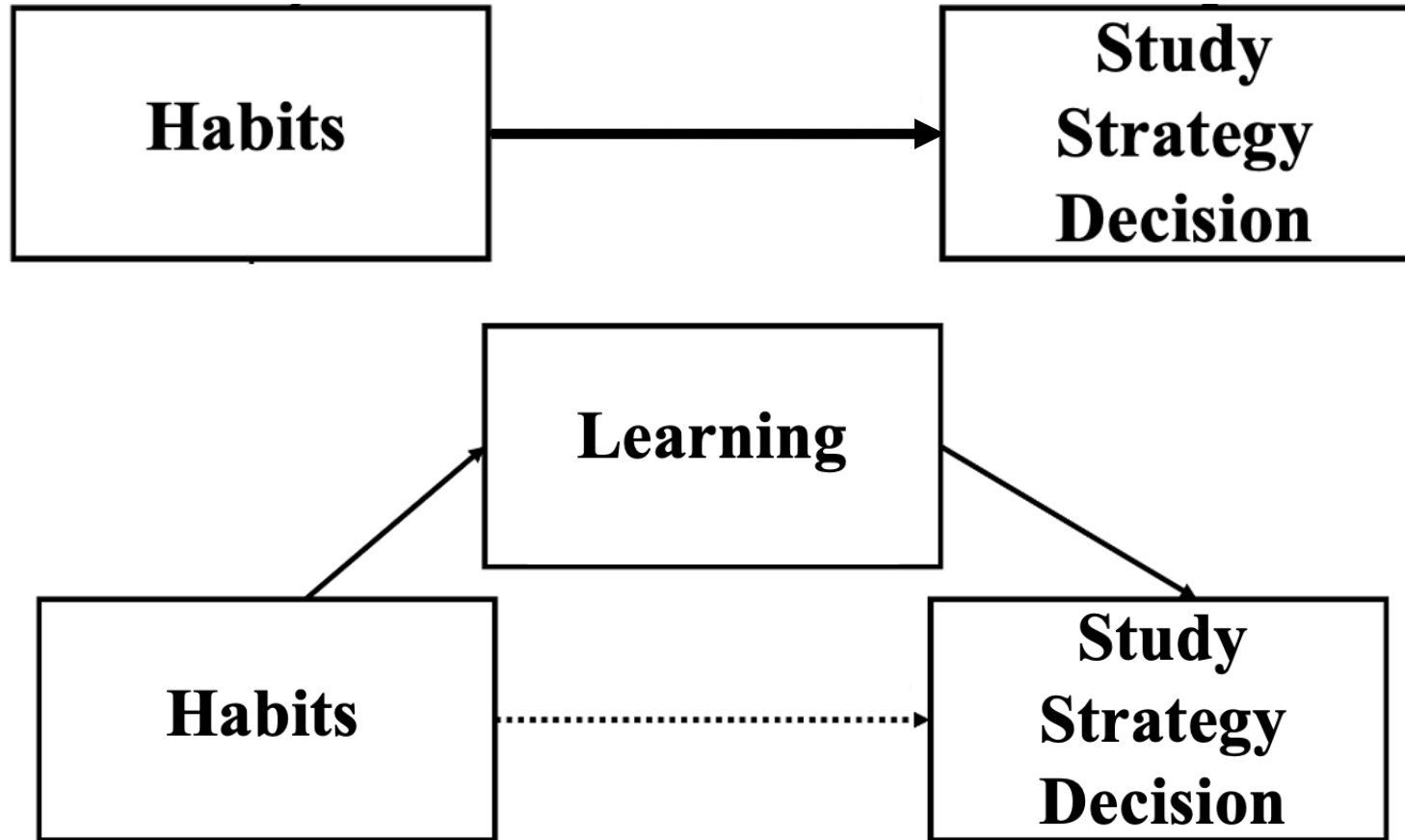
Background: Habits, & Self- regulated Learning

Habits and familiarity influence self-regulated learning.

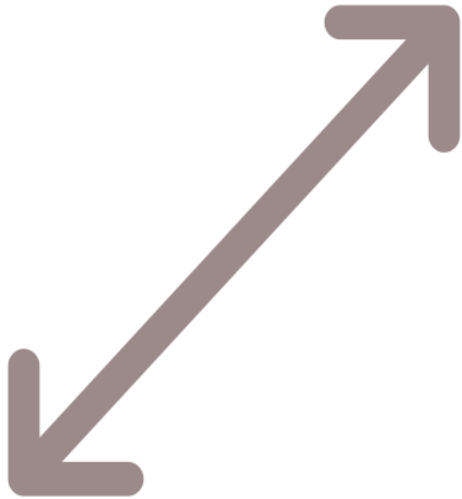
Learners prefer familiar strategies, regardless of what they feel they are learning from.

Strategy familiarity contributes to the feeling of learning.

Background: Habits & Self-regulated Learning



Motivation & Project Goals



Expand upon the **misinterpreted-effort model** by looking at **habits**



Gain a greater understanding of **self-regulated learning** behavior

Method: Design



Blocked

(Finch-Finch-Finch)



Interleaved

(Sparrow-Tyrant Flycatcher-Wood Warbler)



Methods: Participants & Materials

Sample Size

- Experiment 1: $N = 328$
- Experiment 2: $N = 377$

Study Phases (6 total bird families)

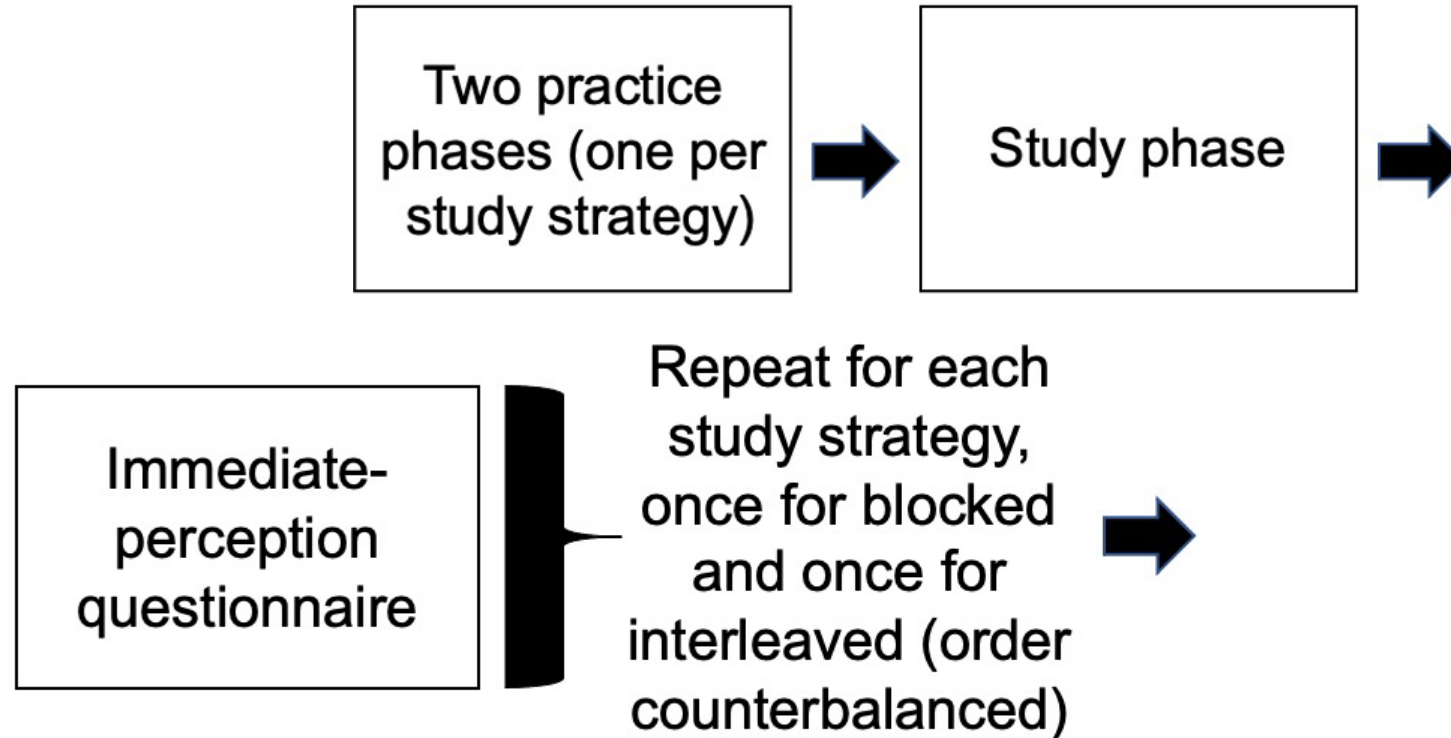
Study Phase 1



Study Phase 2



Methods: Procedure



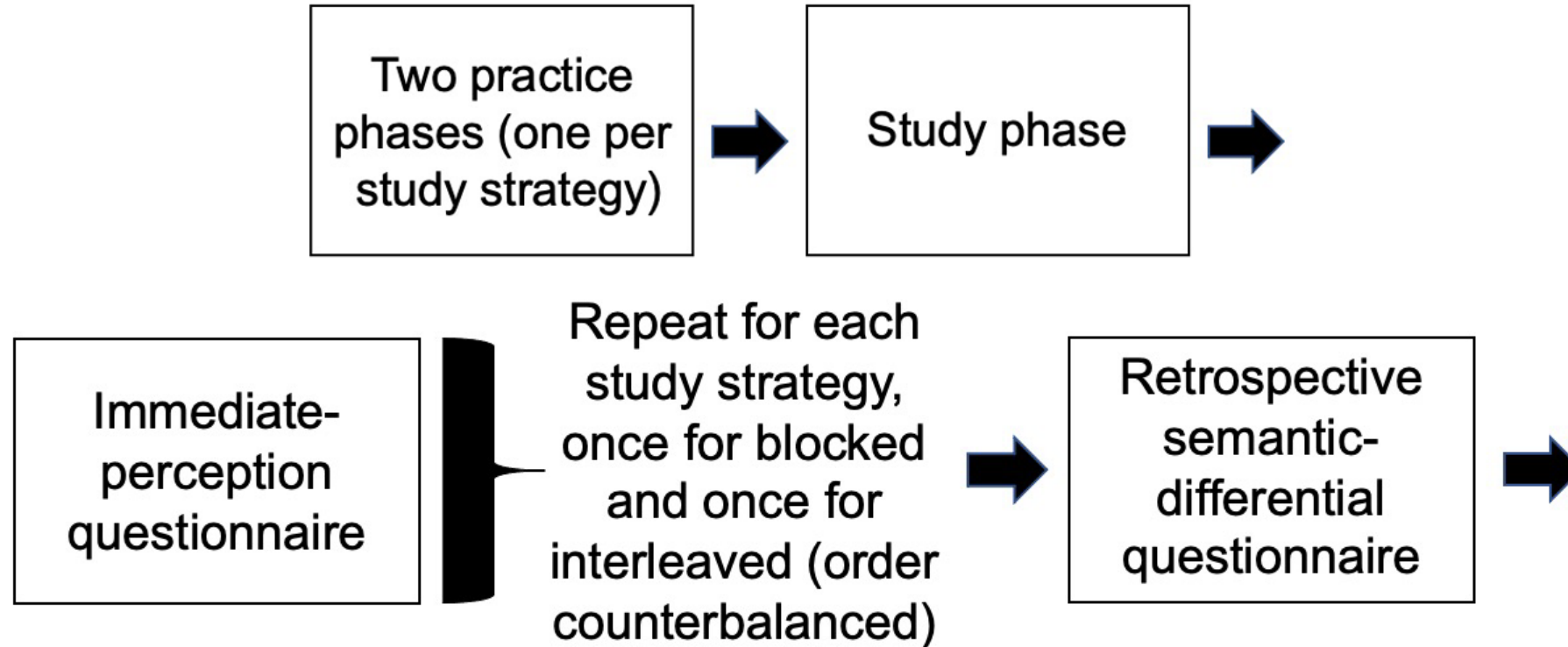
Methods: Questionnaire Materials

Immediate-perception Questionnaire

Likert Scale (1 = a little, 6 = a lot)

- **4 Mental Effort Items** (e.g., “How mentally exhausting was the last exercise?”)
- **4 Learning Items** (e.g., “How well did you learn to distinguish between the types of birds?”)
- **4 Habits Items** (e.g., “How well did the last exercise match your study habits?”)

Methods: Procedure



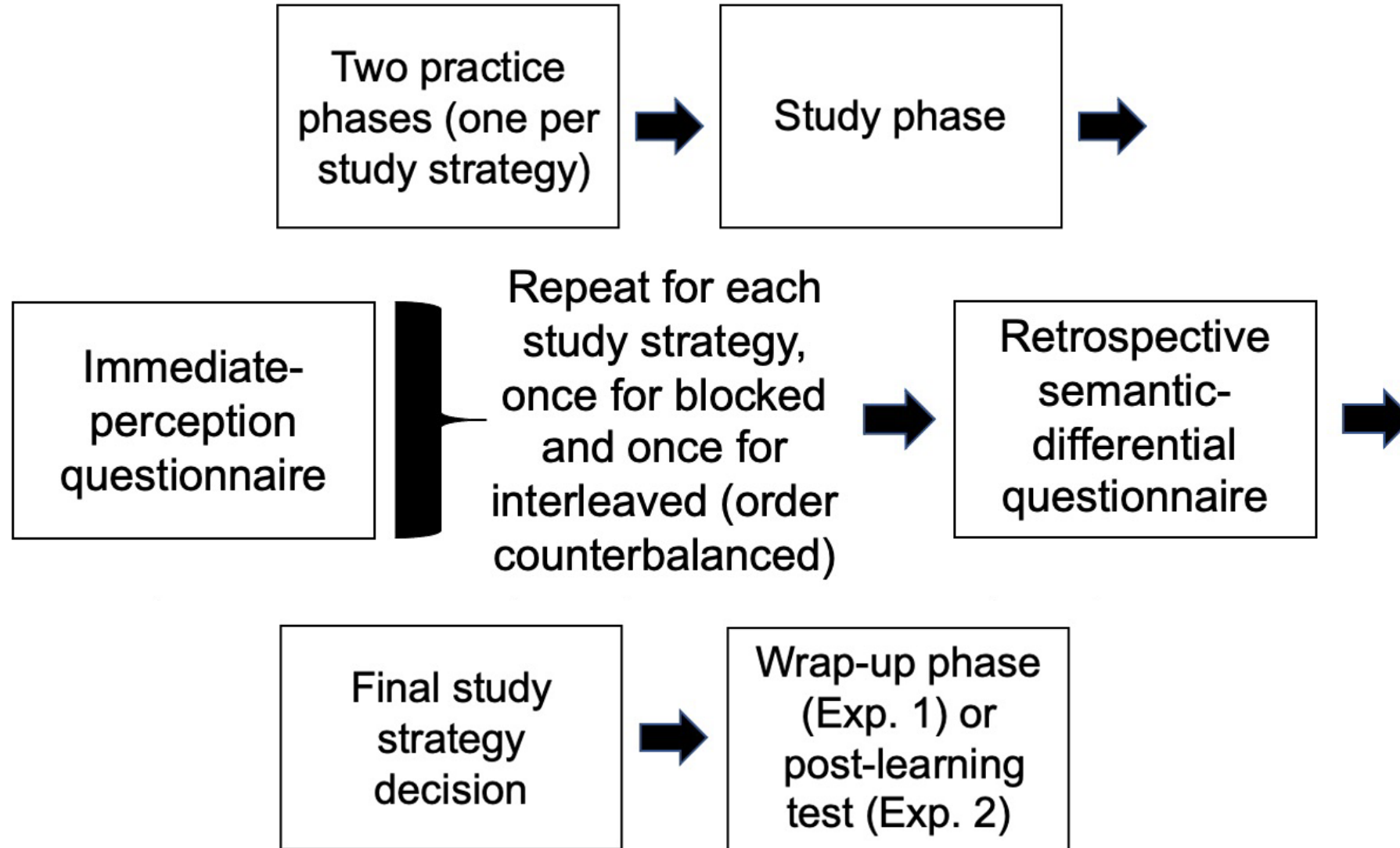
Methods: Questionnaire Materials

Retrospective Semantic-differential Questionnaire

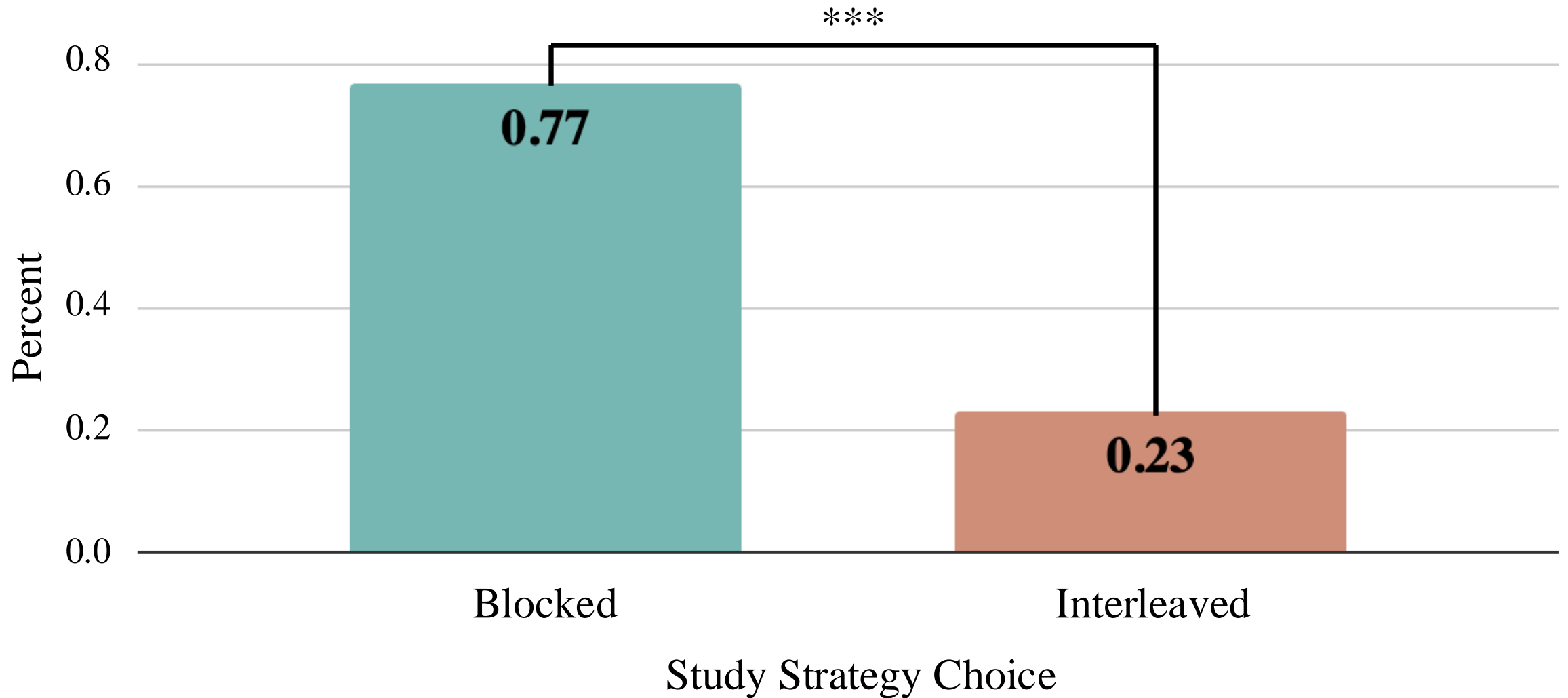
Likert Scale (1 = blocked, 6 = interleaved)

- **4 Mental Effort Items** (e.g., “Which exercise required more mental effort?”)
- **4 Learning Items** (e.g., “Which do you think is a more effective learning strategy for you?”)
- **4 Habits Items:** (e.g., “Which exercise best matched your study habits?”)

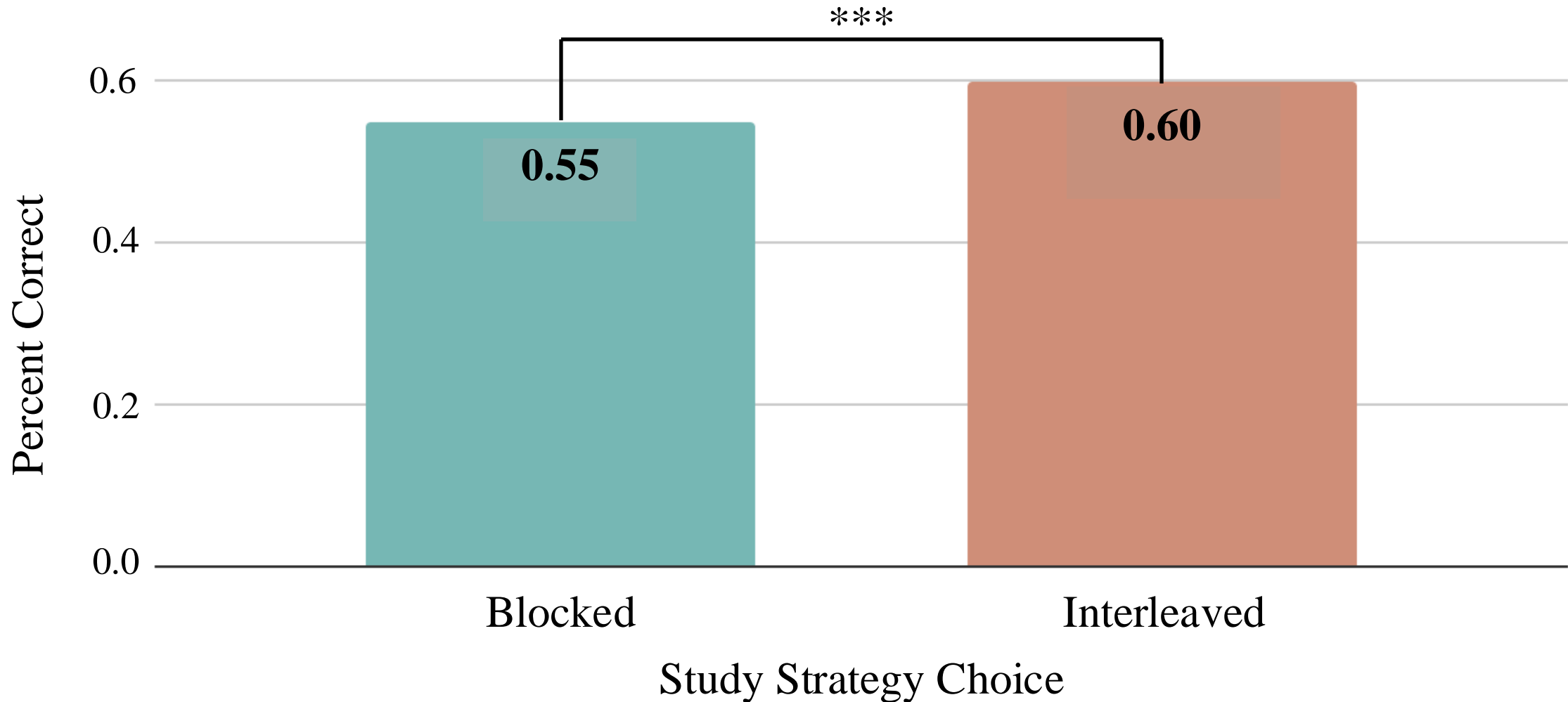
Methods: Procedure



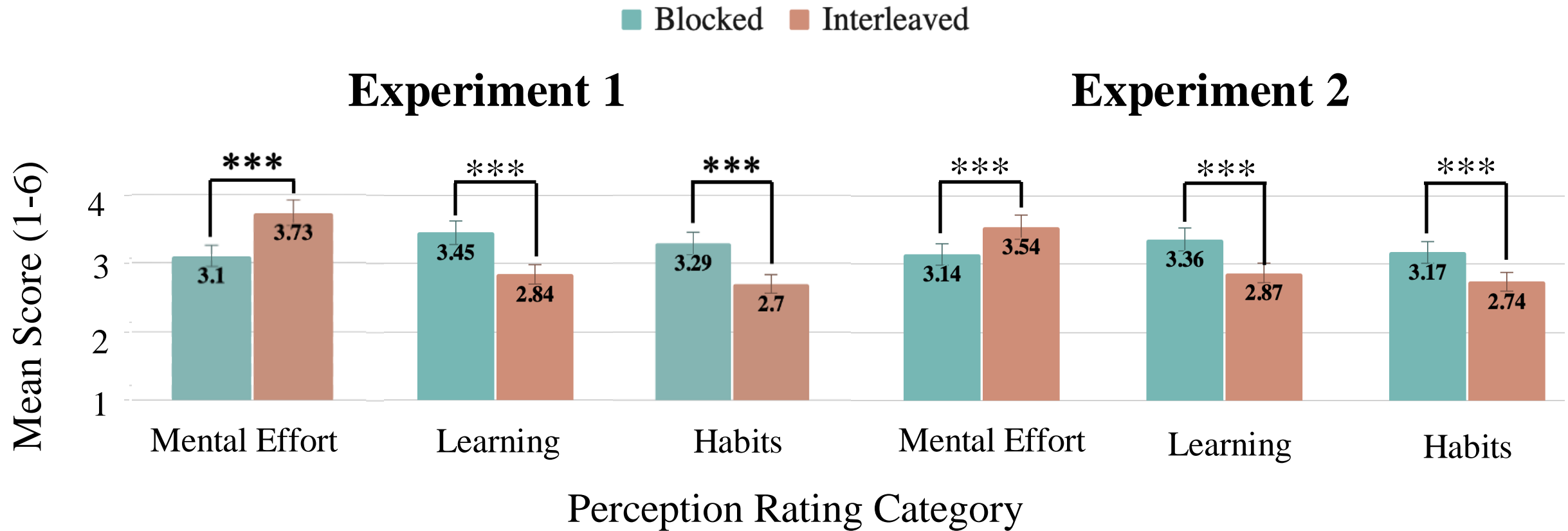
Results (Exp. 1 & Exp. 2): Choice of Strategy



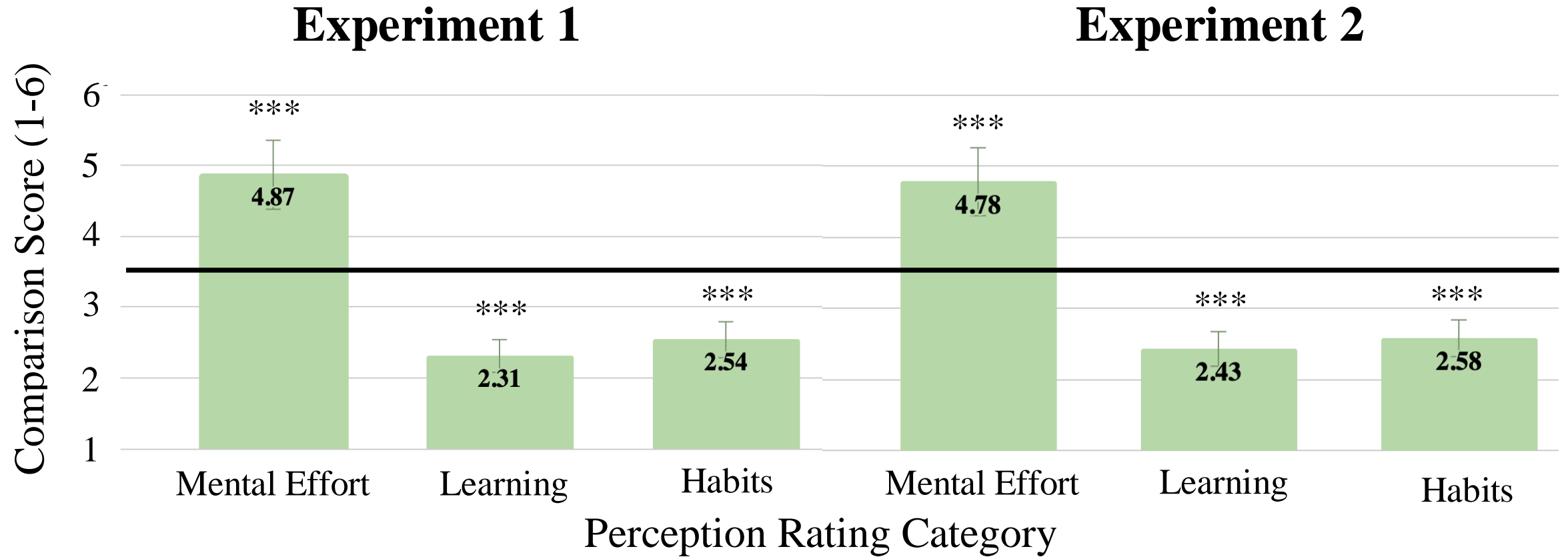
Results (Exp. 2 ONLY): Objective Learning on Post Test



Results: Immediate Perception Ratings

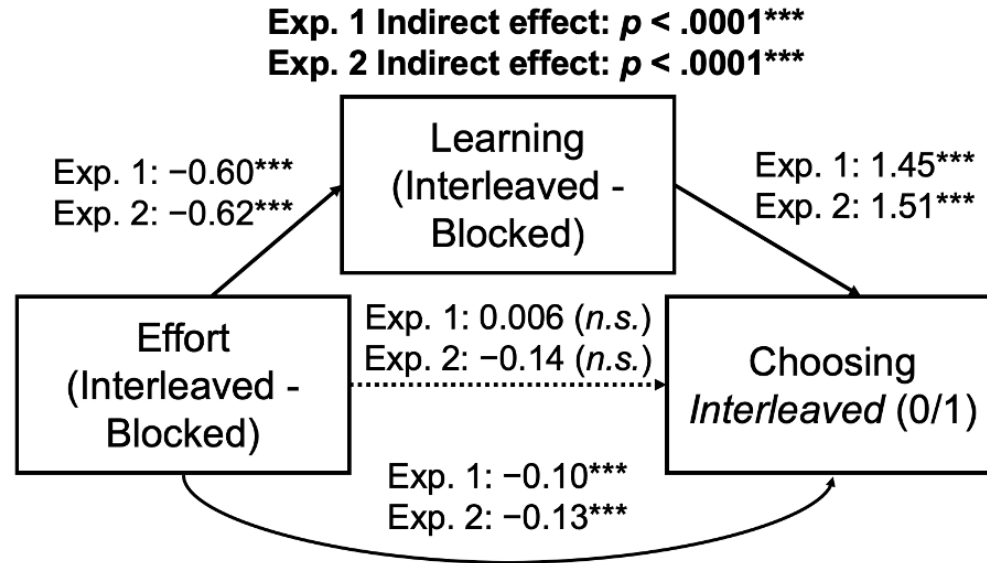


Results: Retrospective Comparisons



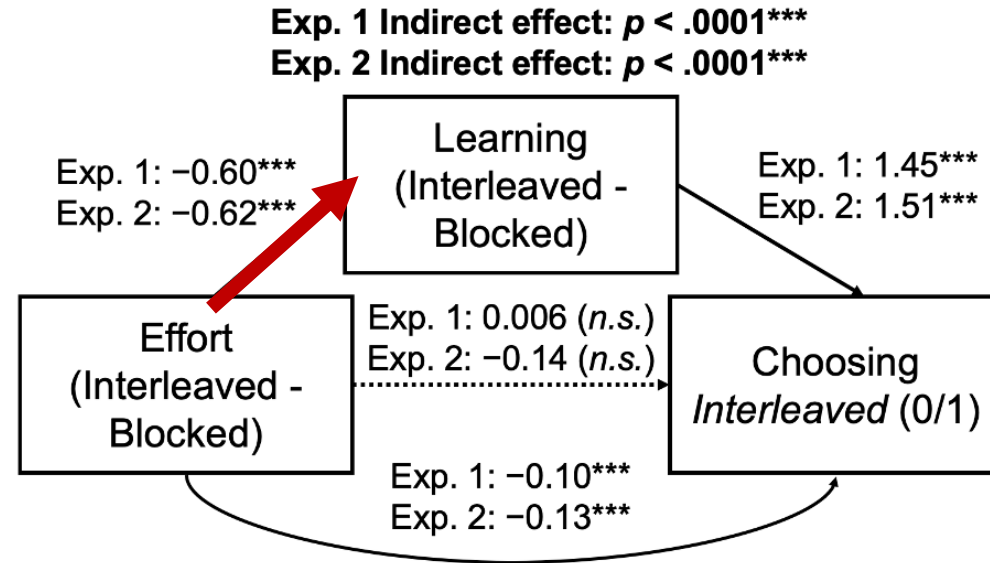
Results (Immediate Perceptions)

Indirect Effect of Perceived Mental Effort



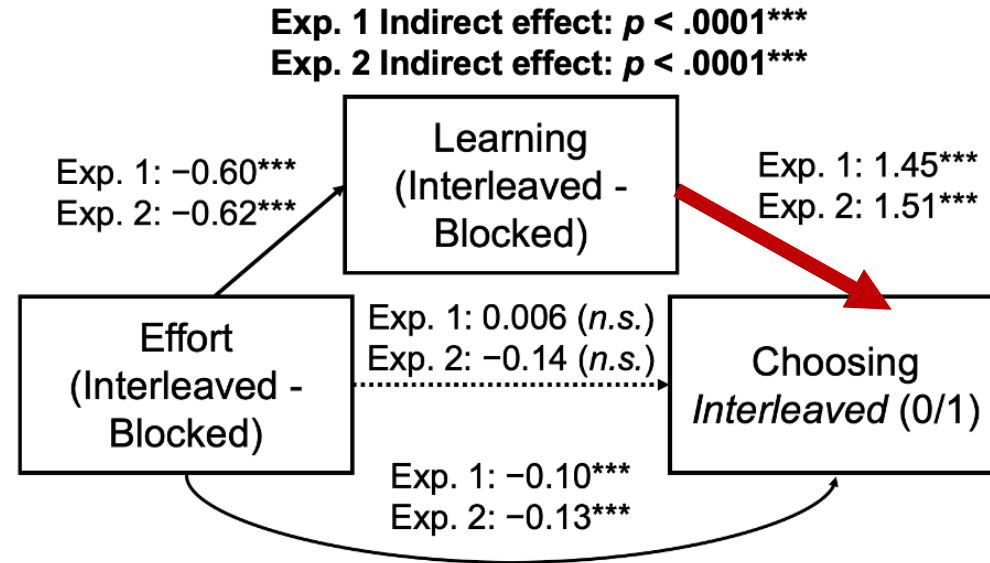
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Indirect Effect of Perceived Mental Effort



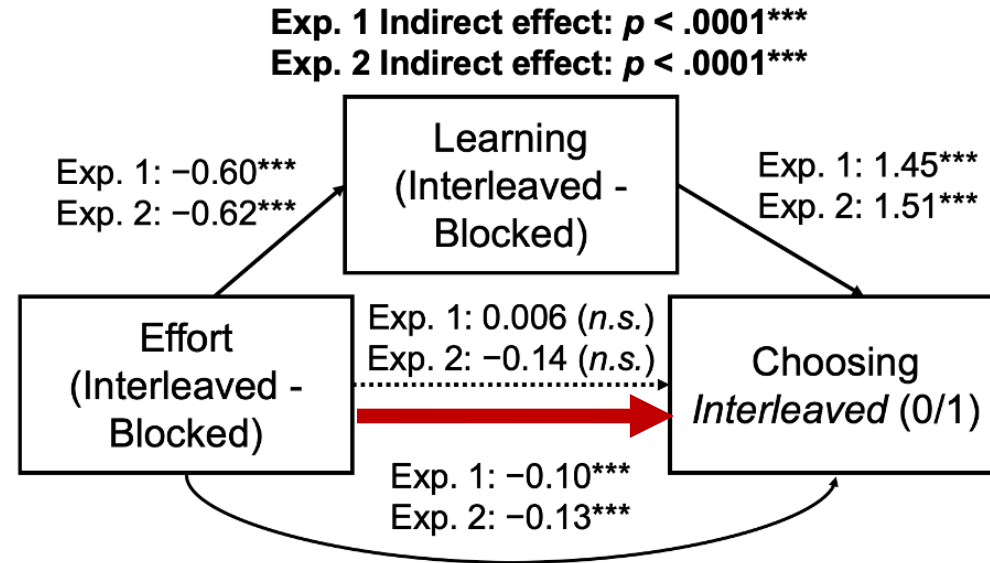
Results (Immediate Perceptions)

Indirect Effect of Perceived Mental Effort



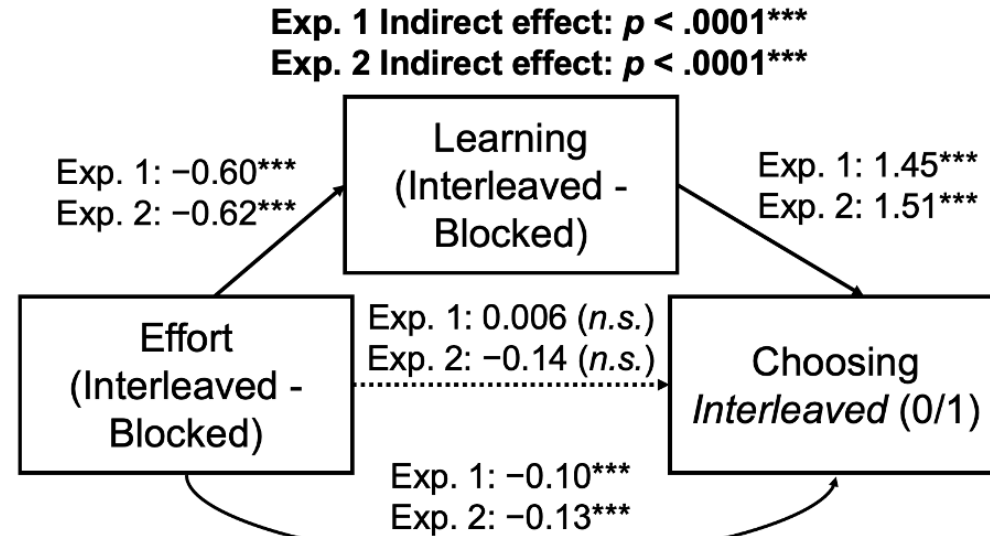
Results (Immediate Perceptions)

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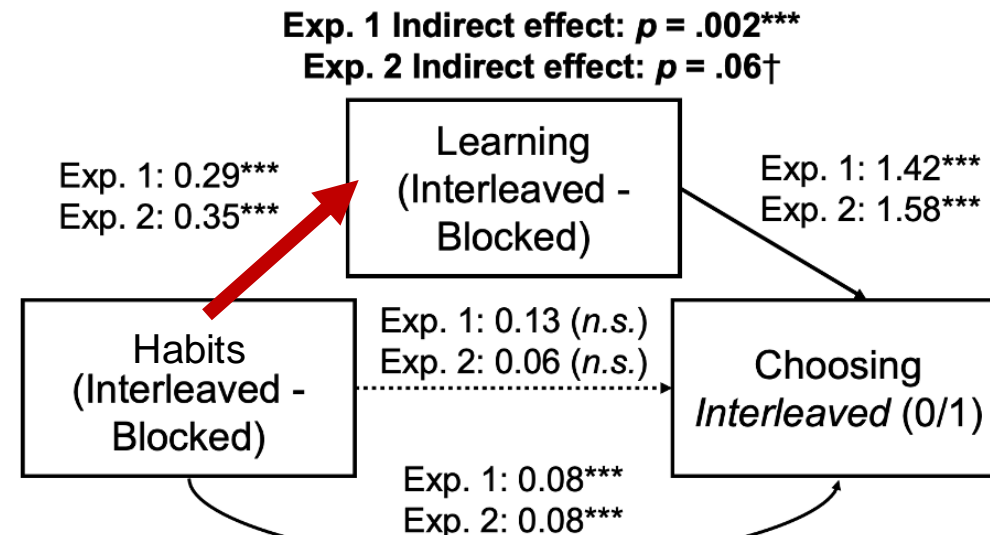


Results (Immediate Perceptions)

Indirect Effect of Perceived Mental Effort

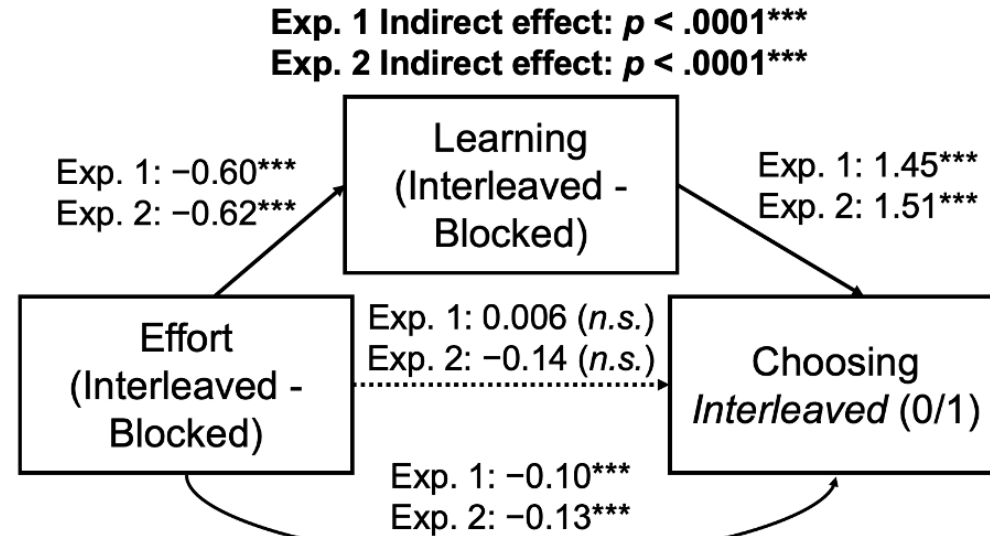


Indirect Effect of Perceived Habits

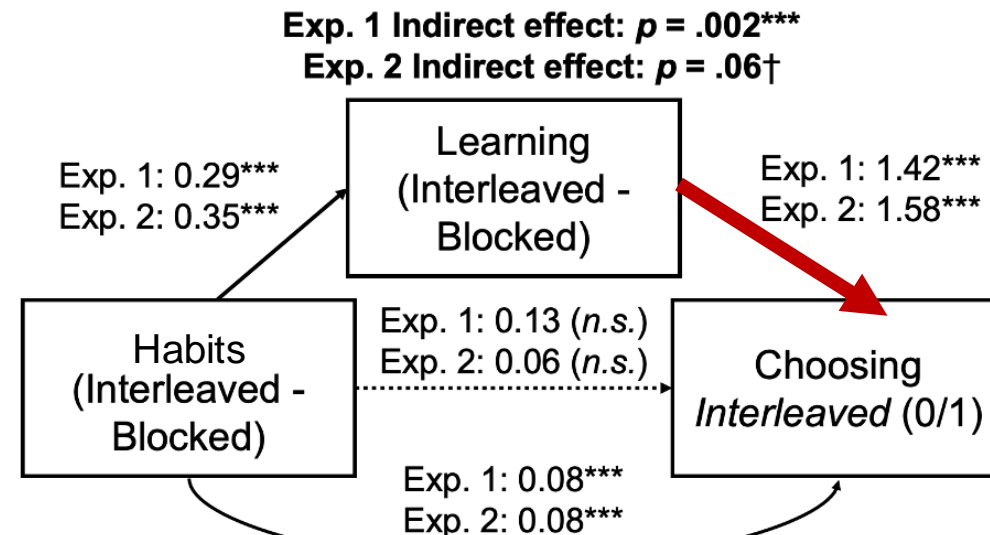


Results (Immediate Perceptions)

Indirect Effect of Perceived Mental Effort

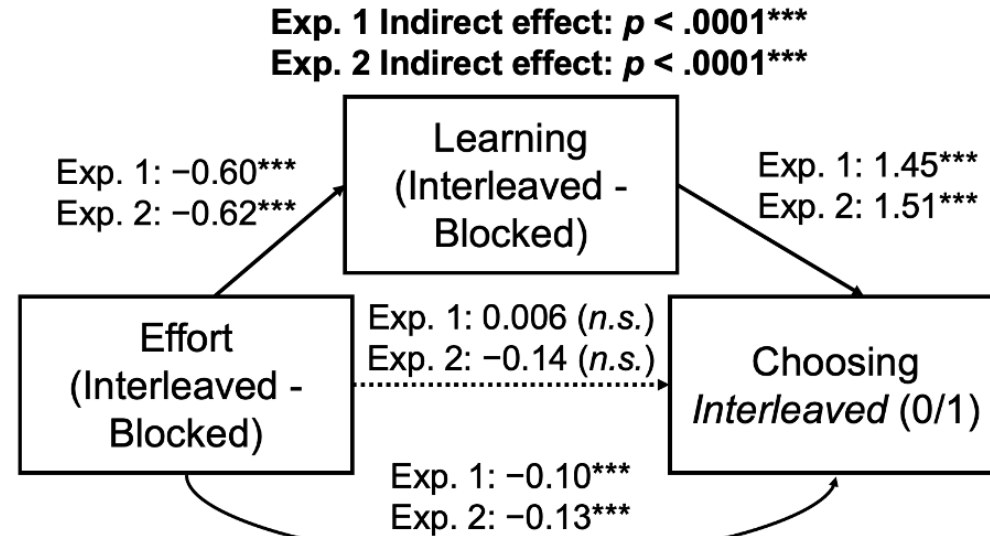


Indirect Effect of Perceived Habits

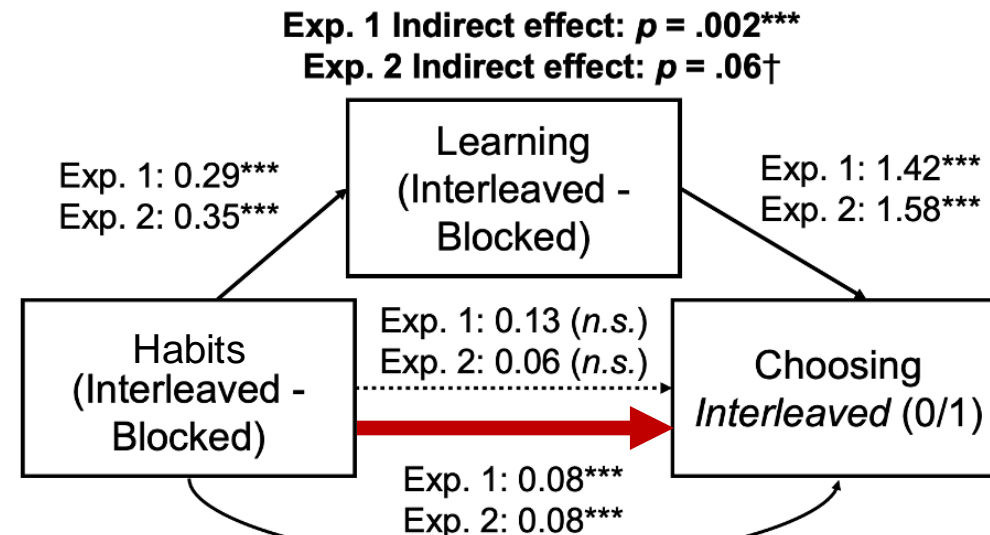


Results (Immediate Perceptions)

Indirect Effect of Perceived Mental Effort

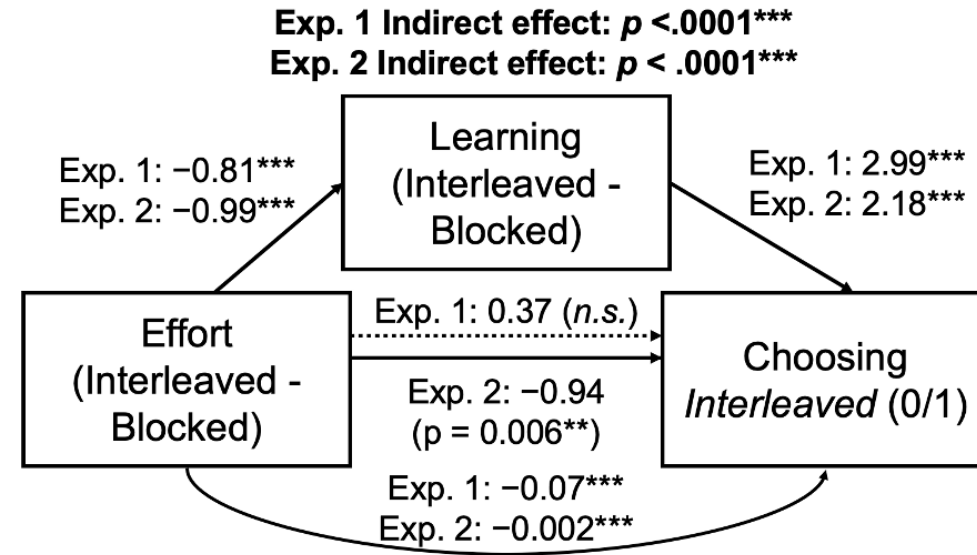


Indirect Effect of Perceived Habits



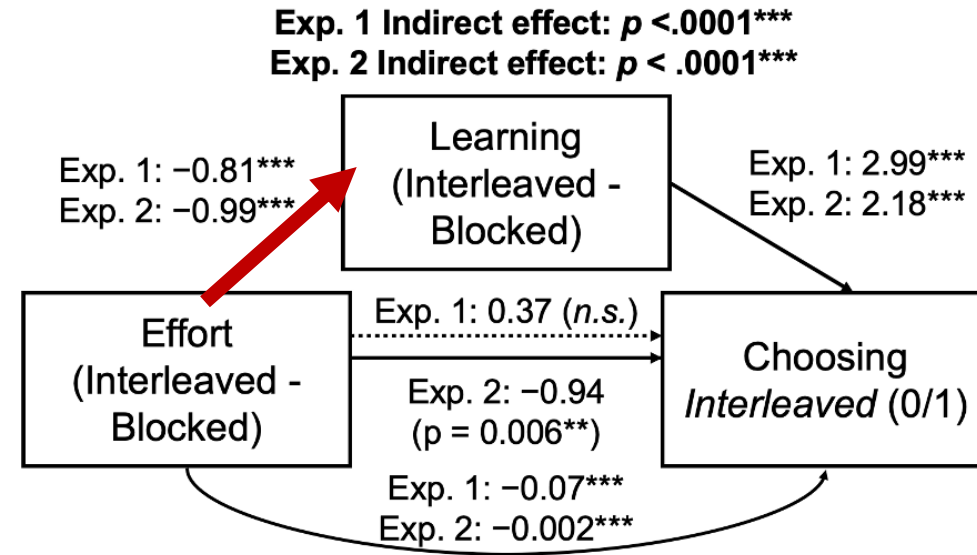
Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort



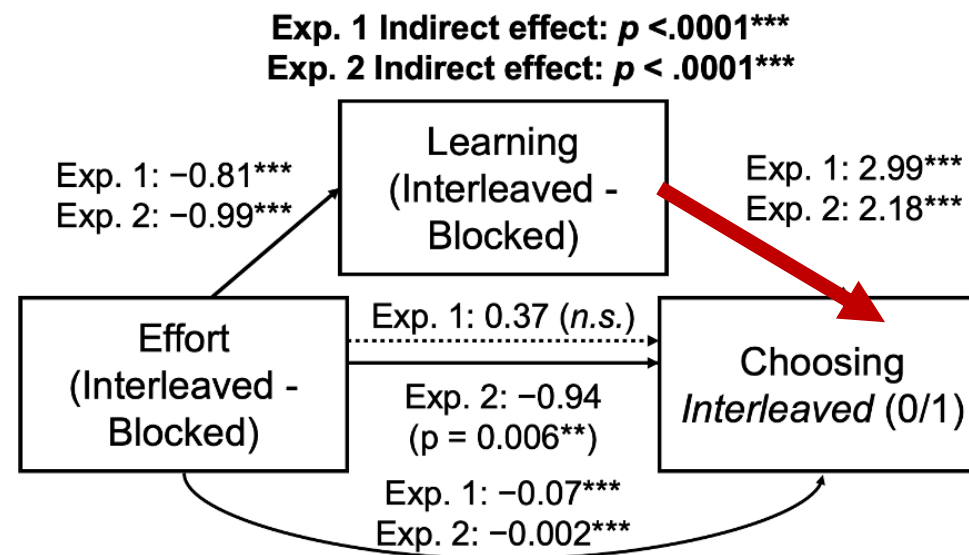
Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort



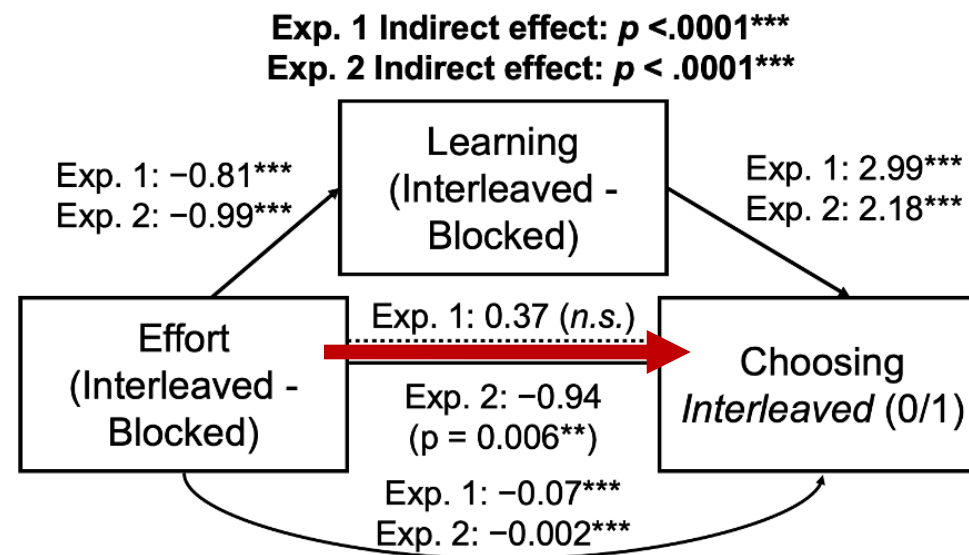
Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort



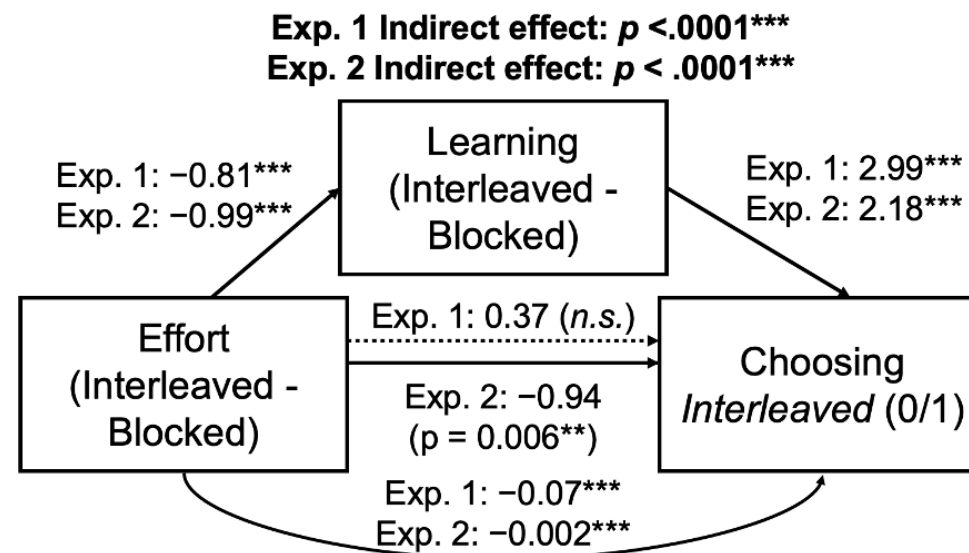
Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort

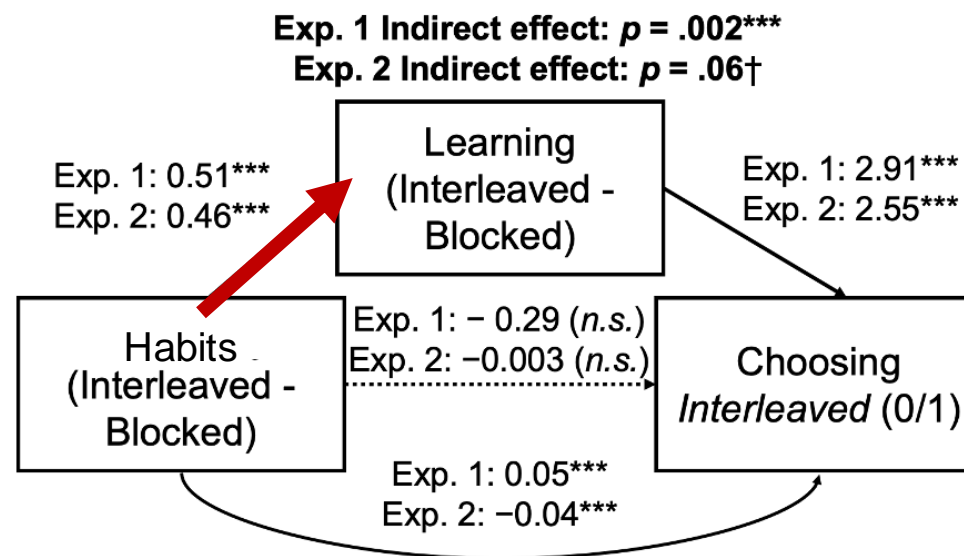


Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort

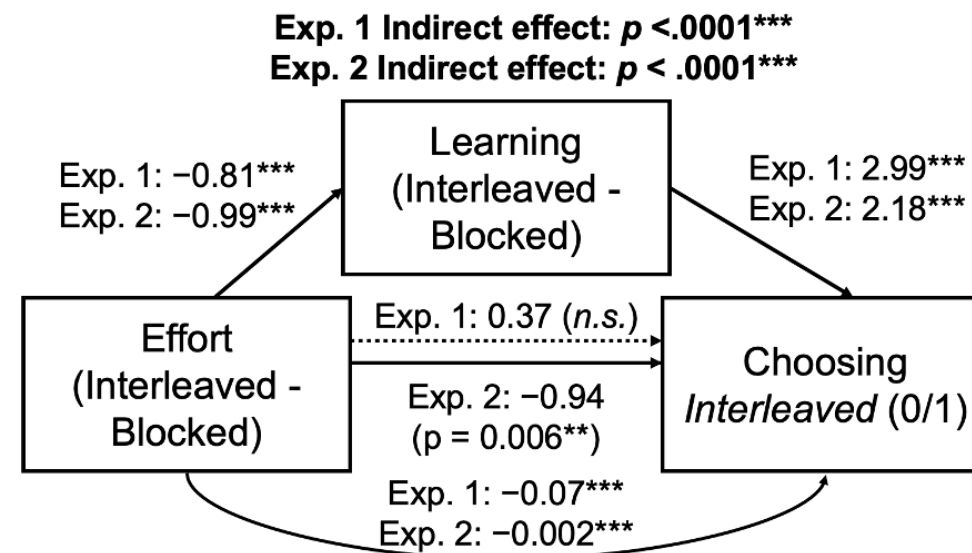


Indirect Effect of Perceived Habits

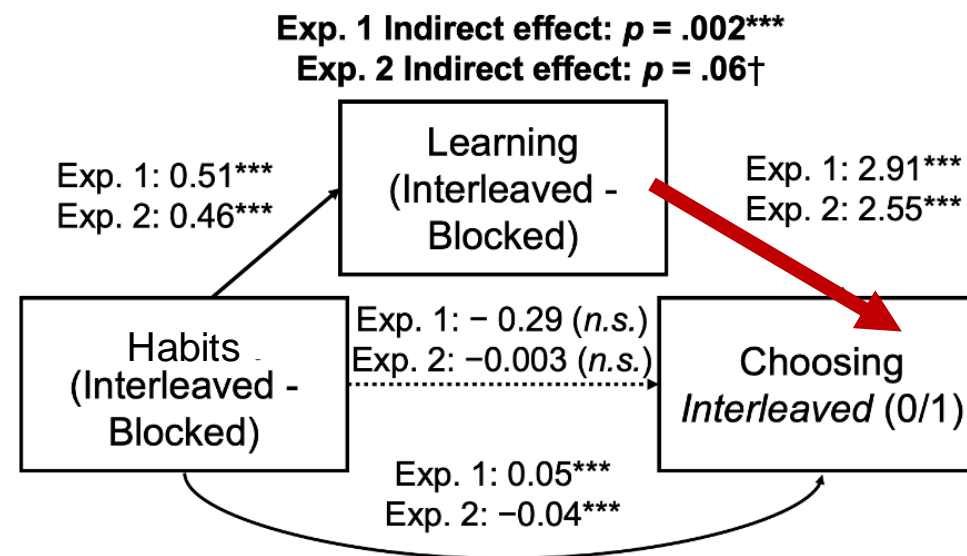


Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort

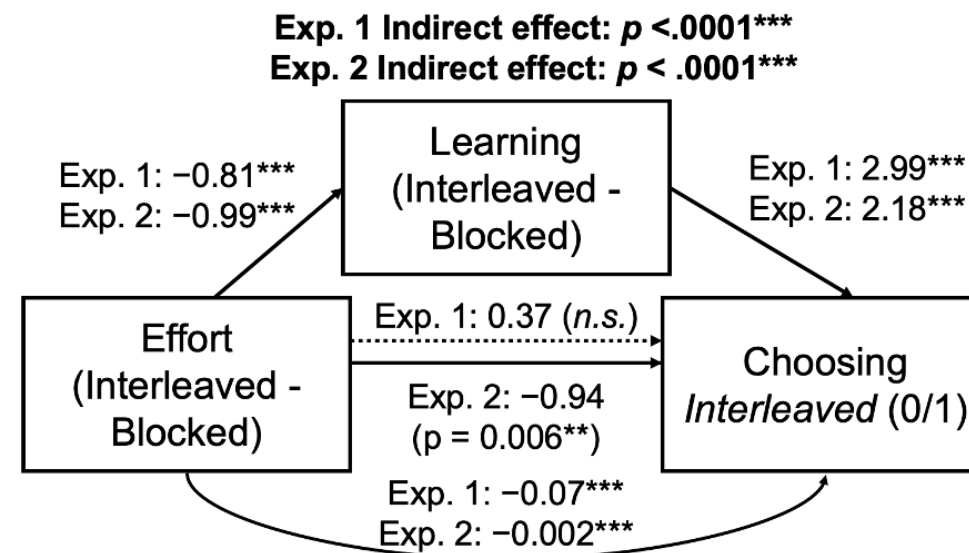


Indirect Effect of Perceived Habits

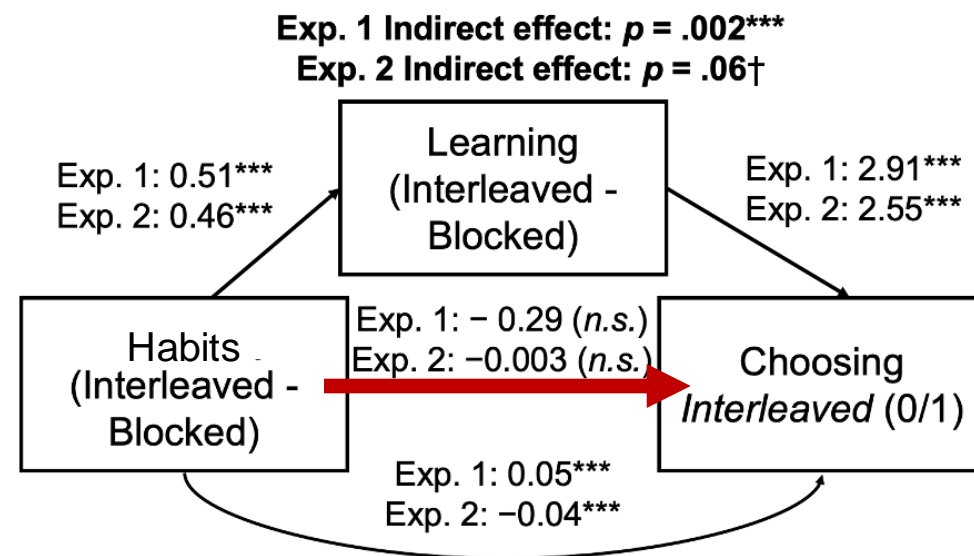


Results (Retrospective Comparisons)

Indirect Effect of Perceived Mental Effort



Indirect Effect of Perceived Habits



Take Aways



Learners interpret the extra effort required by the interleaved study schedule as a sign of poor learning and consequently do not choose it.

Learners found the blocked study schedule more habitual, and this tendency predicted the degree to which they perceived blocking as more favorable for their long-term learning.

Learners do not choose strategies simply because they are habitual or easy, but rather because they interpret such strategies as better for learning.

Discussion



Even when participants were explicitly told that 90% of learners learn better when items are interleaved, they still prefer blocking over interleaving.

Learners are not evading strategies because they are effortful or not habitual, they attempt to pick the optimal strategy, but, due to perceived mental effort and unfamiliarity, they mistakenly believe that a blocked schedule is best for learning.

Real-world Implications

Highlight the importance of desirable difficulties

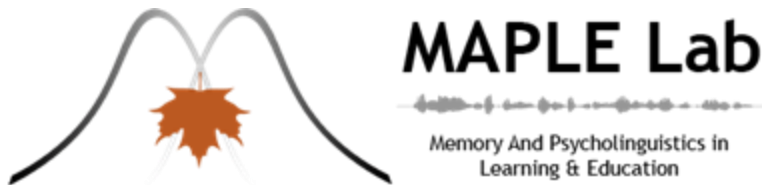
Promote understanding that familiar study habits aren't necessarily the most effective

Bridge the gap between research and learner's choice of learning strategies

Acknowledgments



We would like to thank the MAPLE Lab, the LRDC, and Ramya Beuford for her conceptualization of how habits and familiarity affect our perceived learning and thus our self-regulated study strategy decisions.



THANK YOU!



Macaluso, J.A., Beuford, R.R., Fraundorf, S.H. (2022)
Familiar Strategies Feel Fluent: The Role of Study
Strategy Familiarity in the Misinterpreted-Effort Model
of Self-Regulated Learning. *Journal of Intelligence*.
10(4):83. <https://doi.org/10.3390/jintelligence10040083>

