

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



**By Jessica Macaluso**

# 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

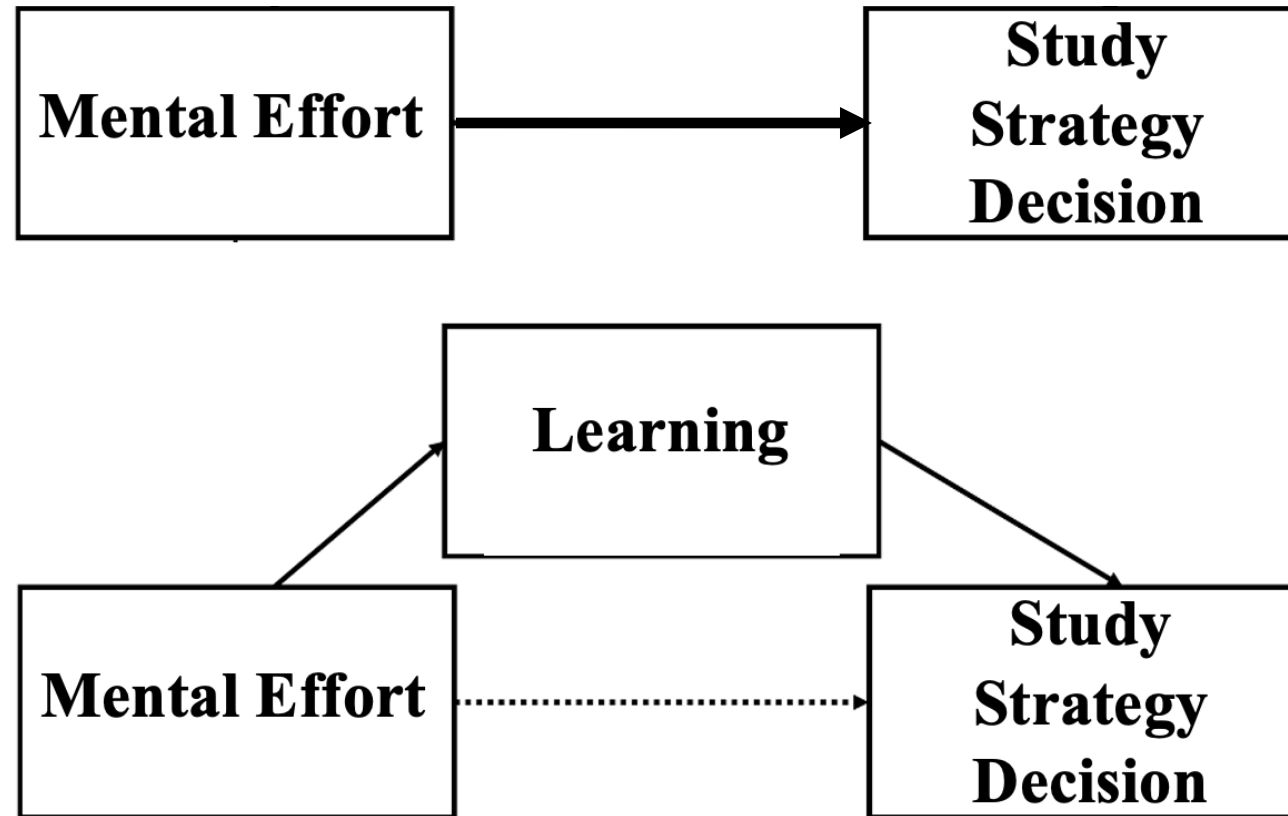


Effective learning  
requires good study  
strategy decisions!

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



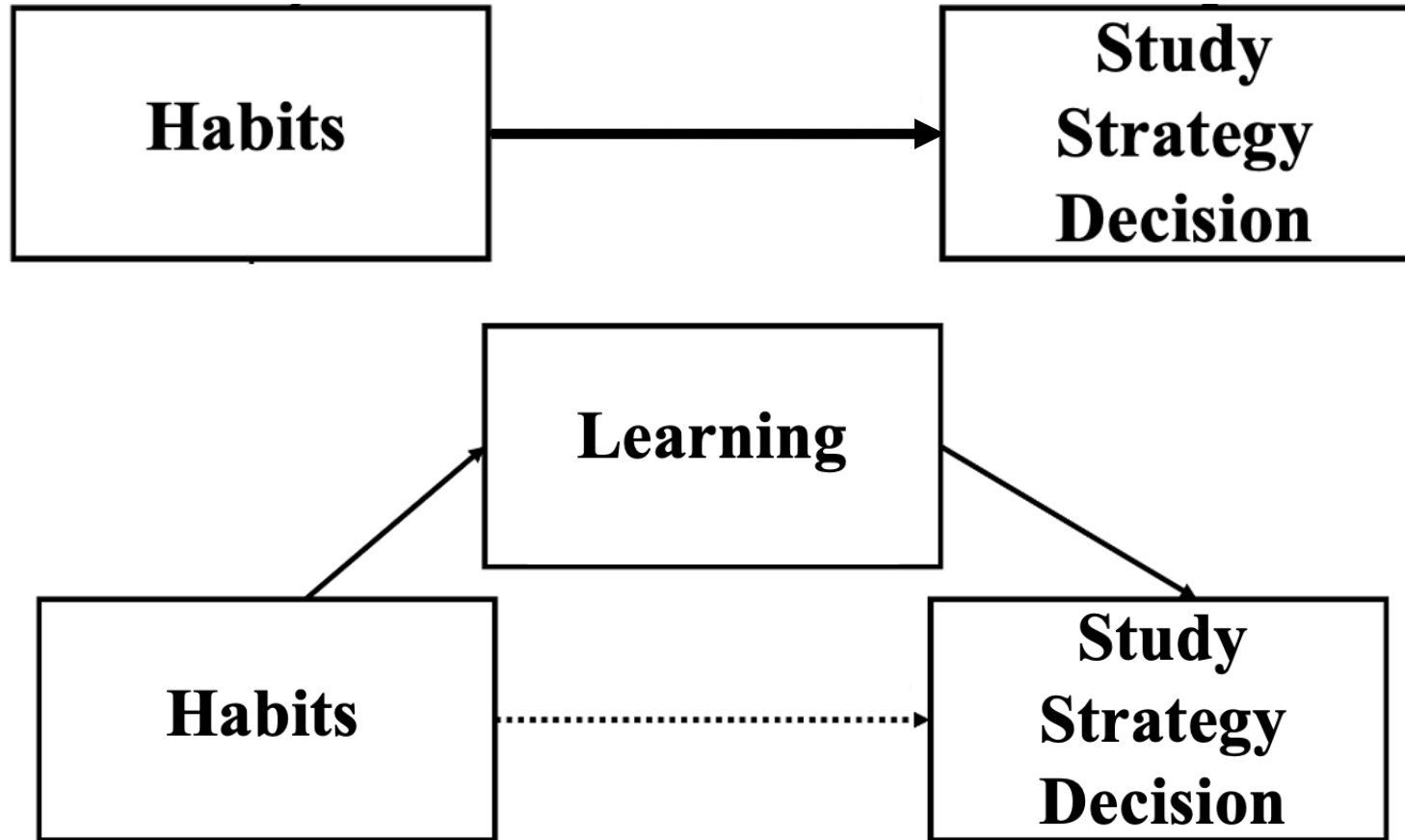
# **Background: Habits, & Self- regulated Learning**

**Habits and familiarity** influence self-regulated learning.

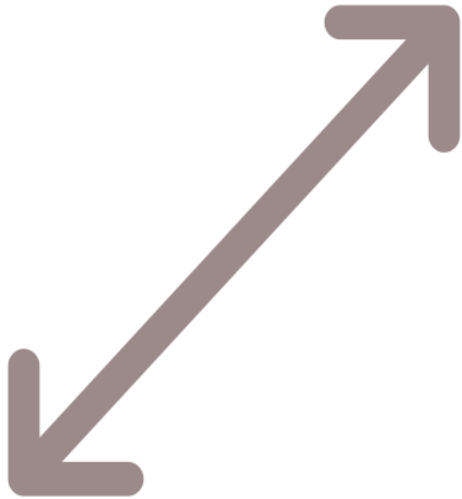
Learners prefer familiar strategies, regardless of what they feel they are learning from.

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)

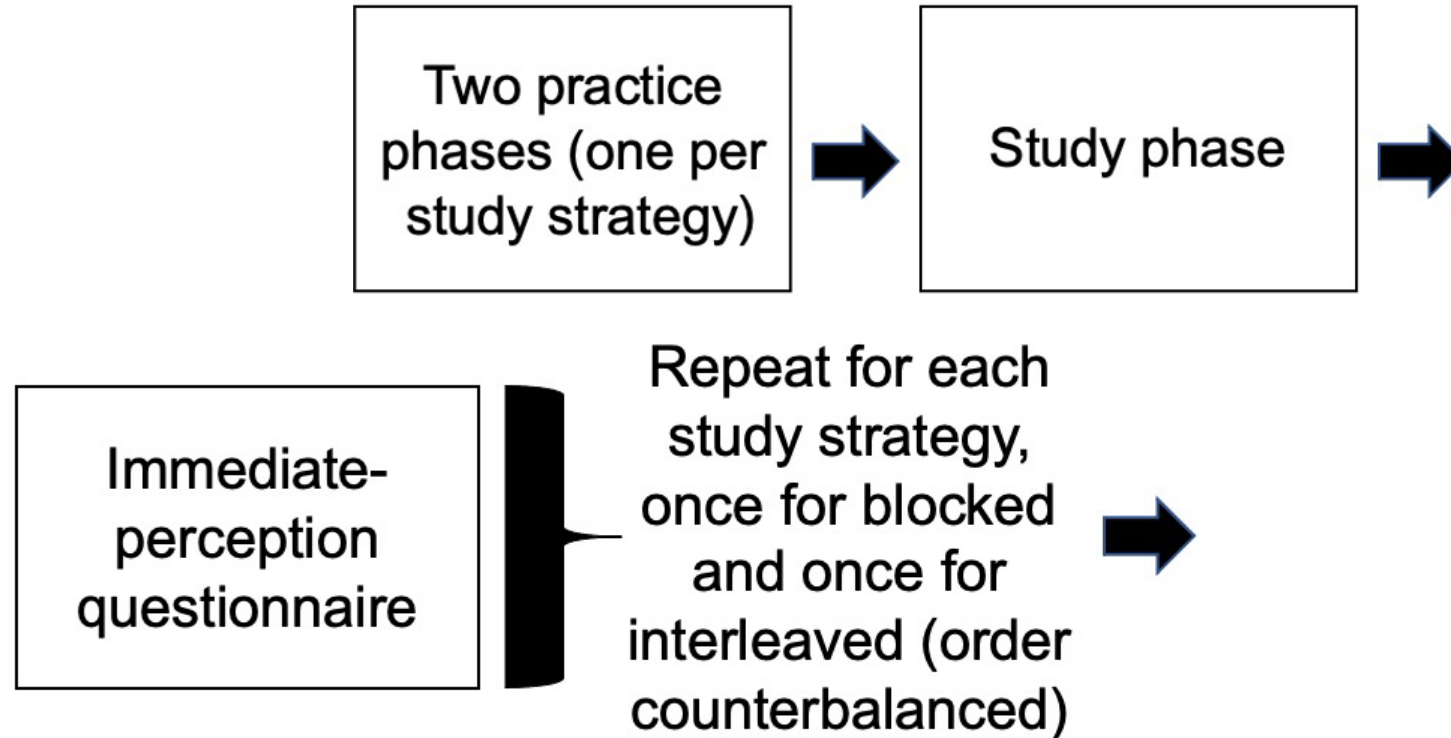
### Study Phase 1



### Study Phase 2



# Methods: Procedure



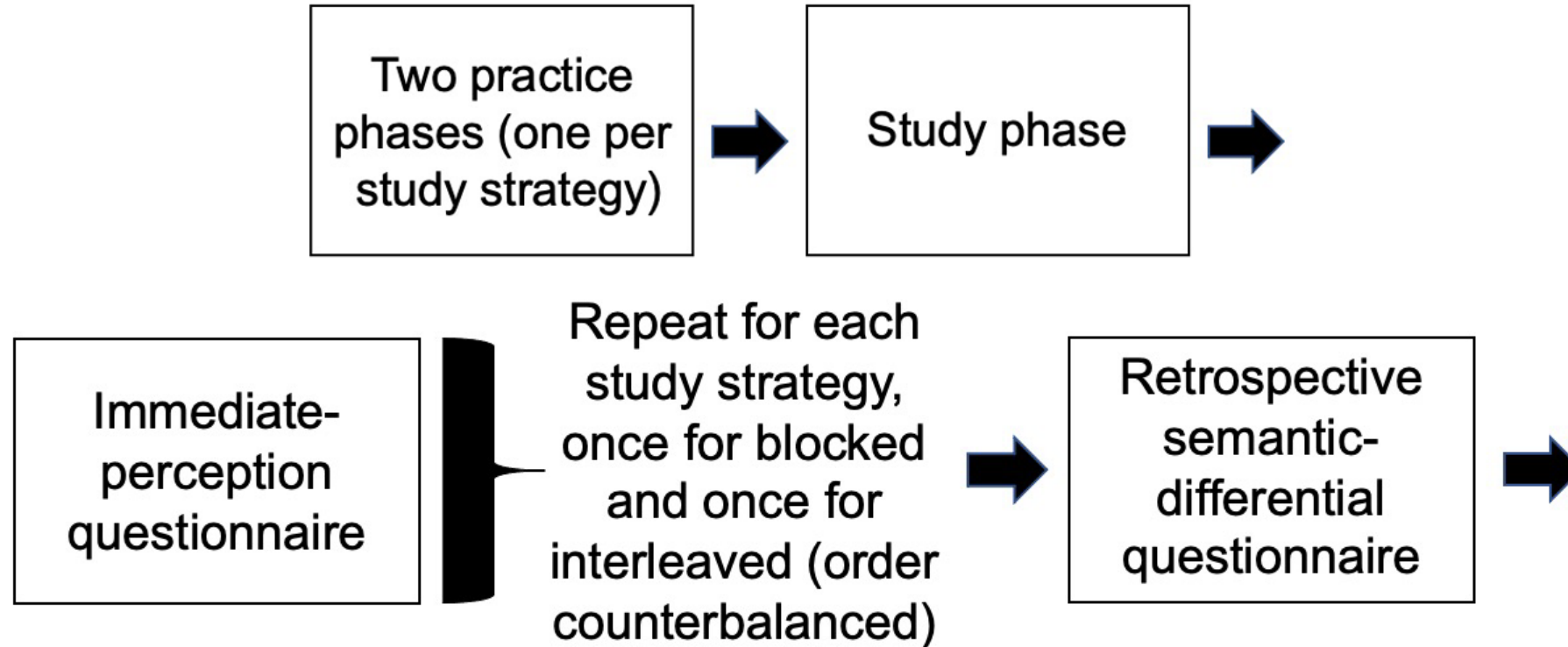
# Methods: Questionnaire Materials

## 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



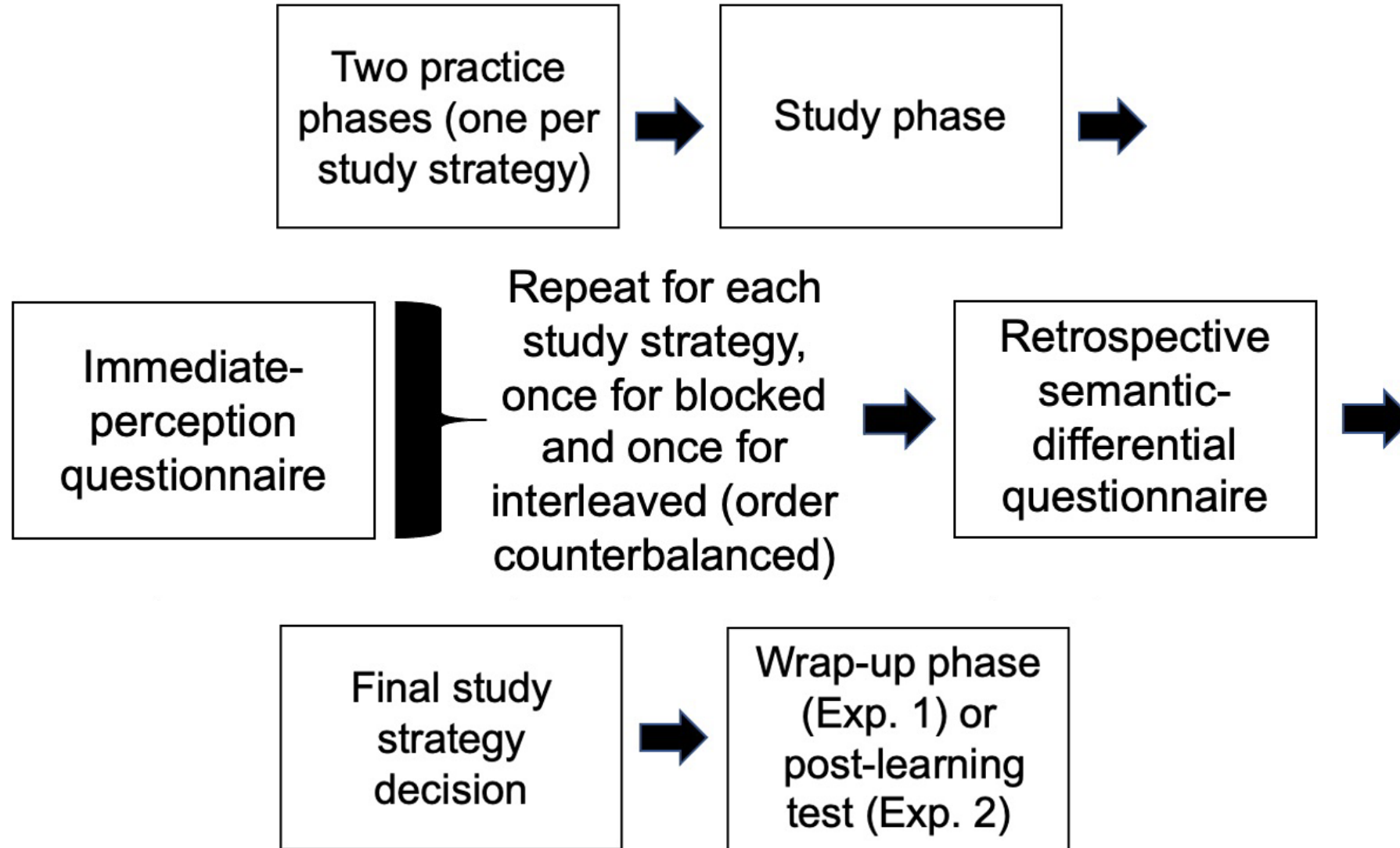
# Methods: Questionnaire Materials

## Retrospective Semantic-differential Questionnaire

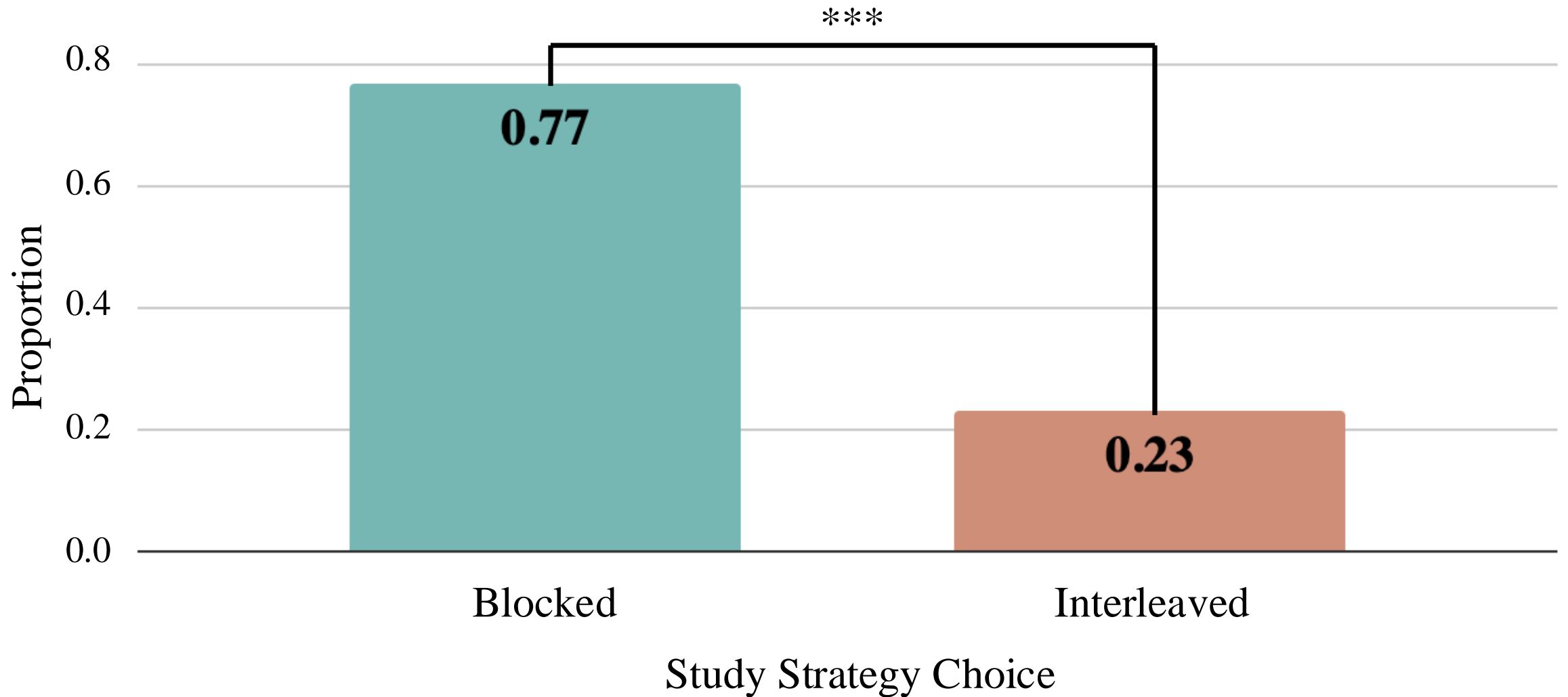
Likert Scale (1 = blocked, 6 = interleaved)

- **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

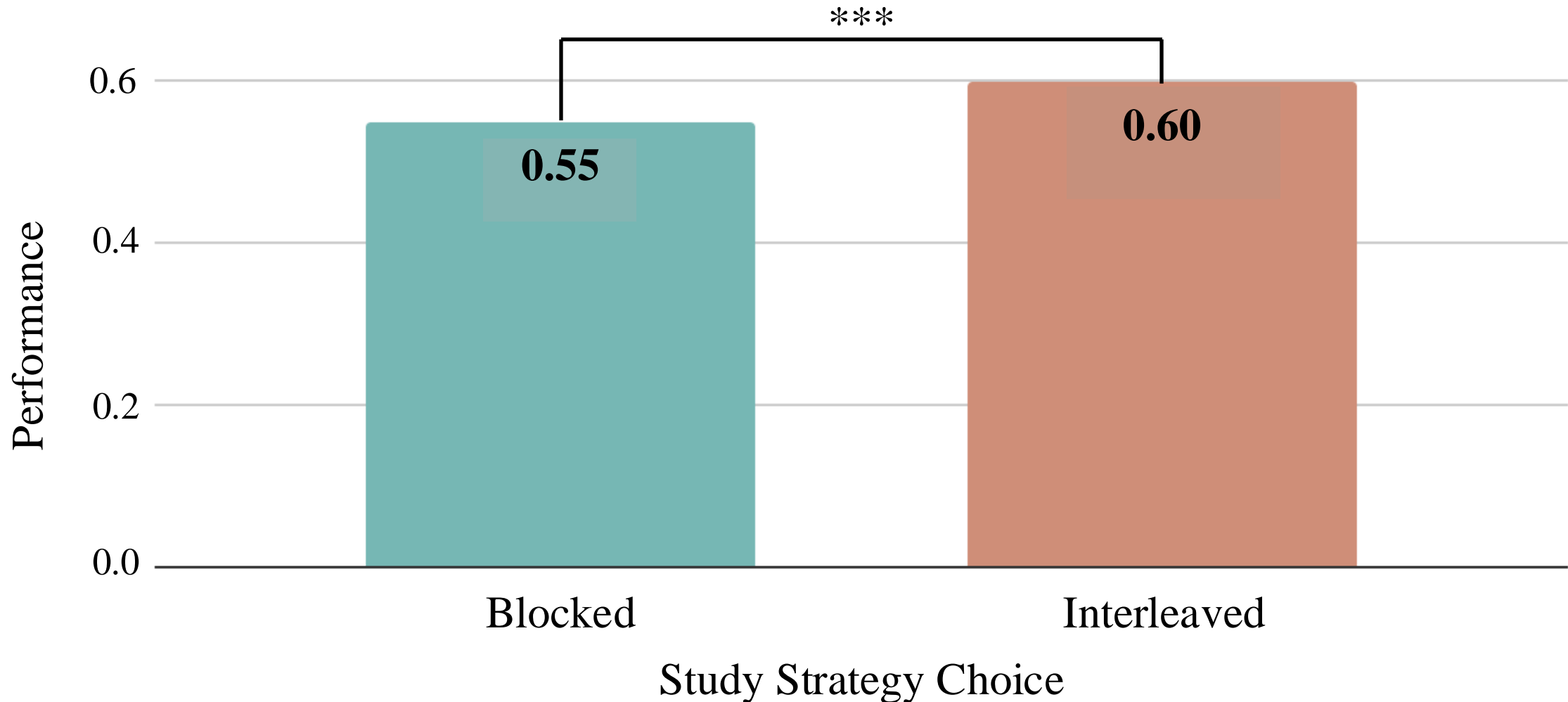


# Results (Exp. 1 & Exp. 2): Choice of Strategy

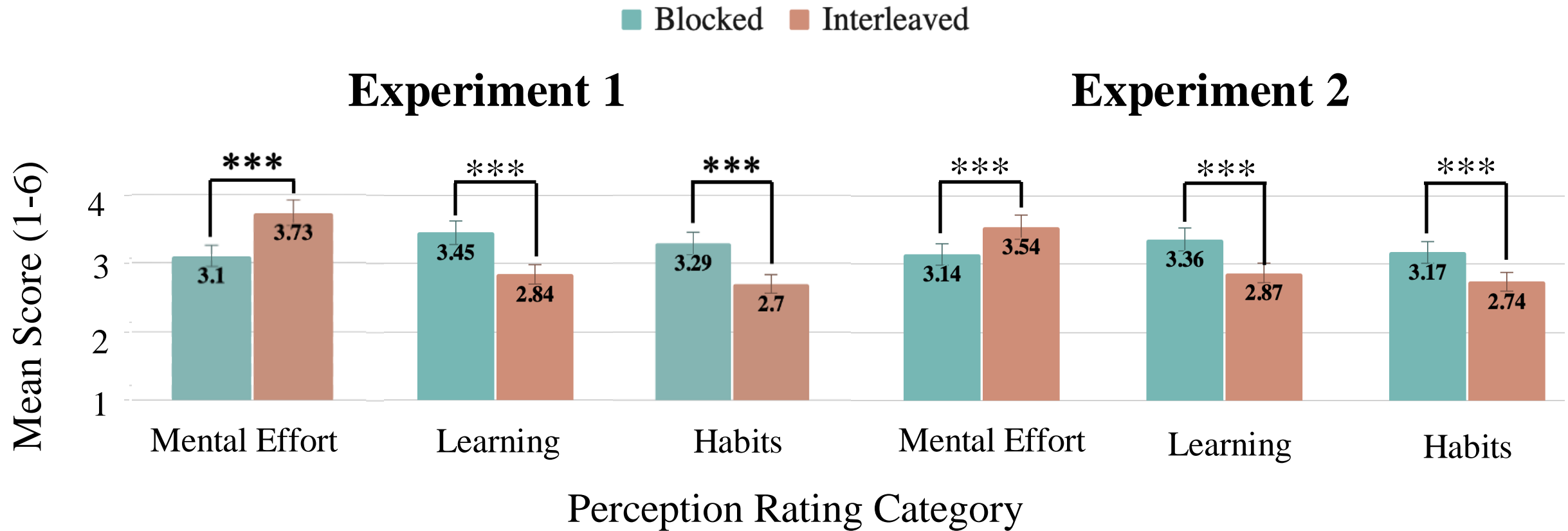




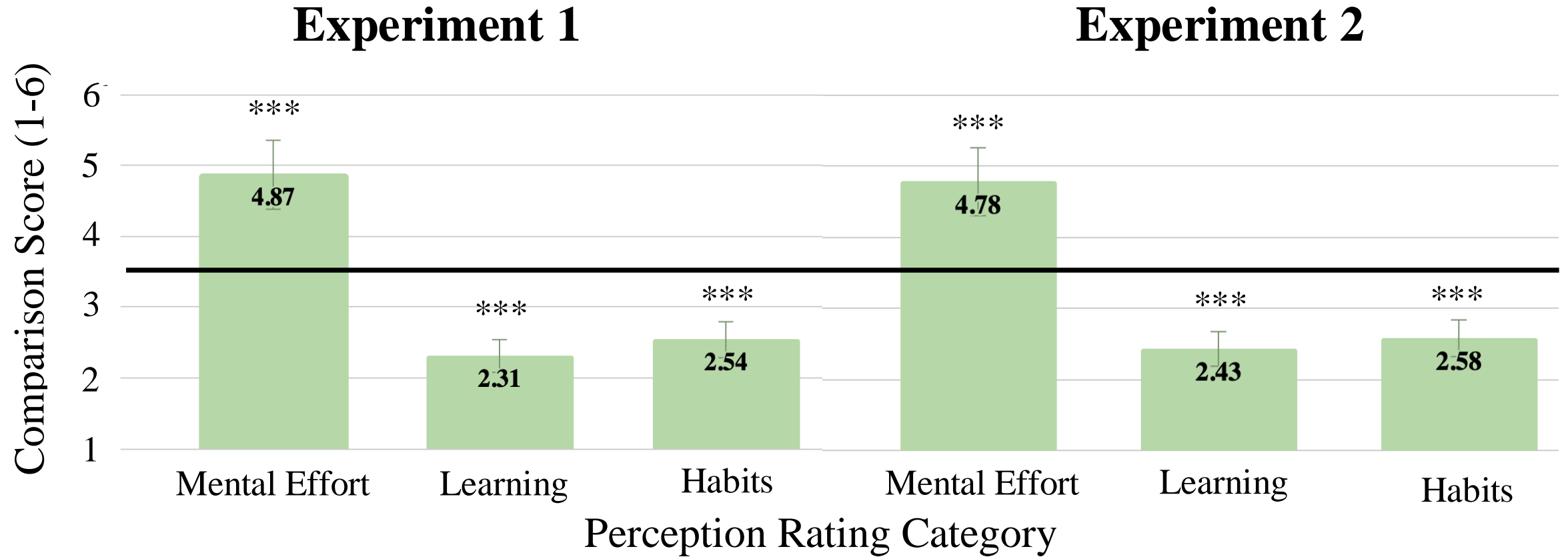
# Results (Exp. 2 ONLY): Objective Learning on Post Test



# Results: Immediate Perception Ratings

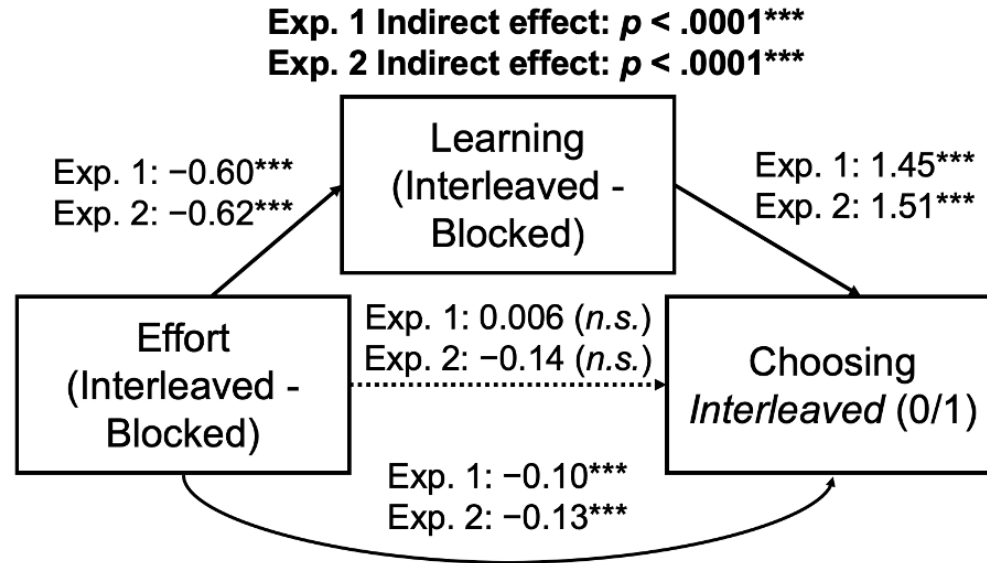


# Results: Retrospective Comparisons



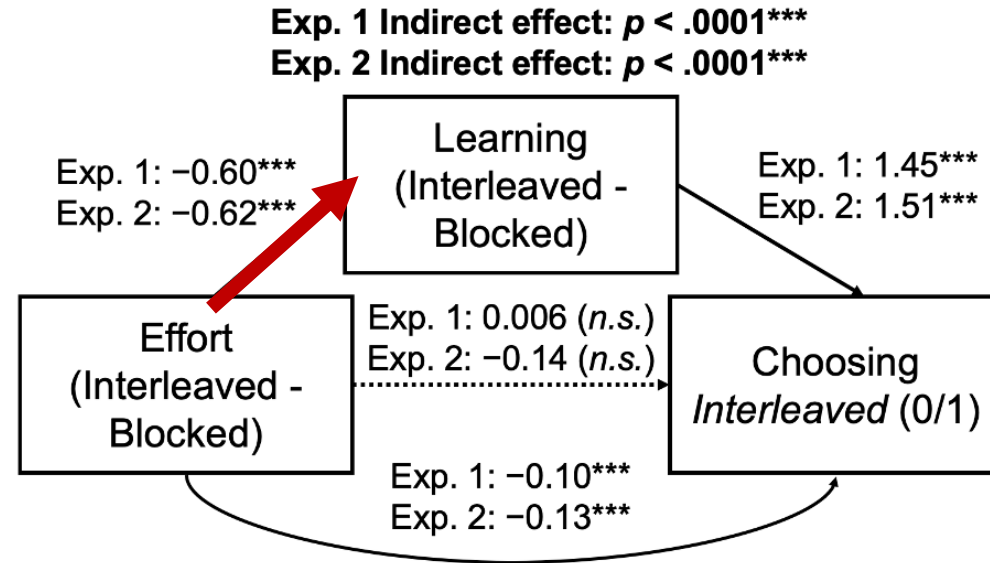
# Results (Immediate Perceptions)

## Indirect Effect of Perceived Mental Effort



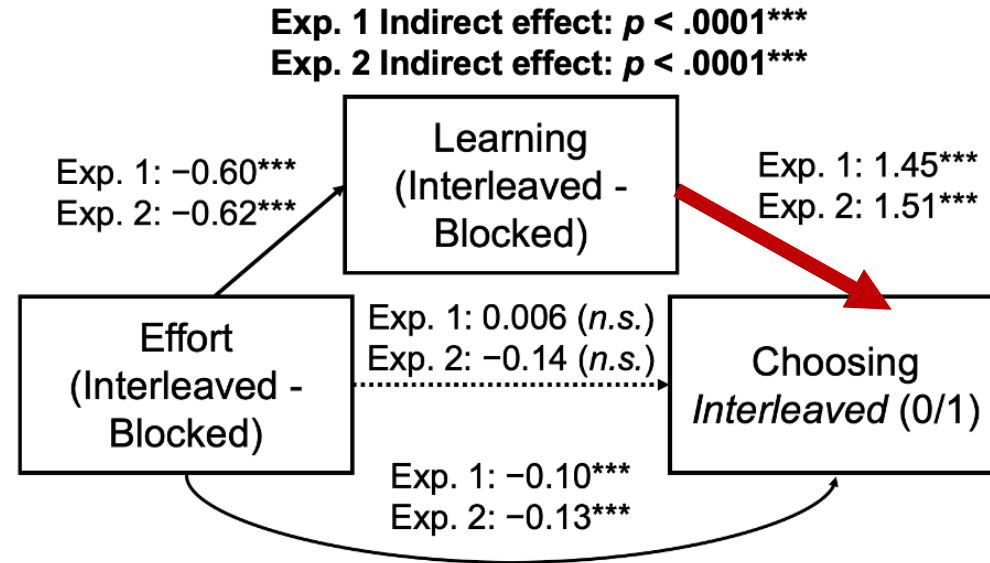
# Results (Immediate Perceptions)

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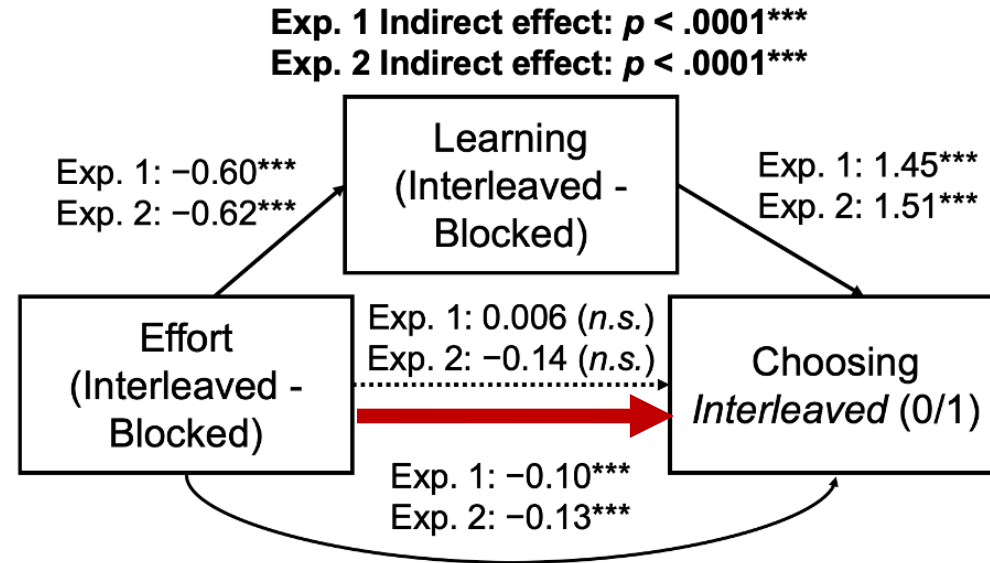
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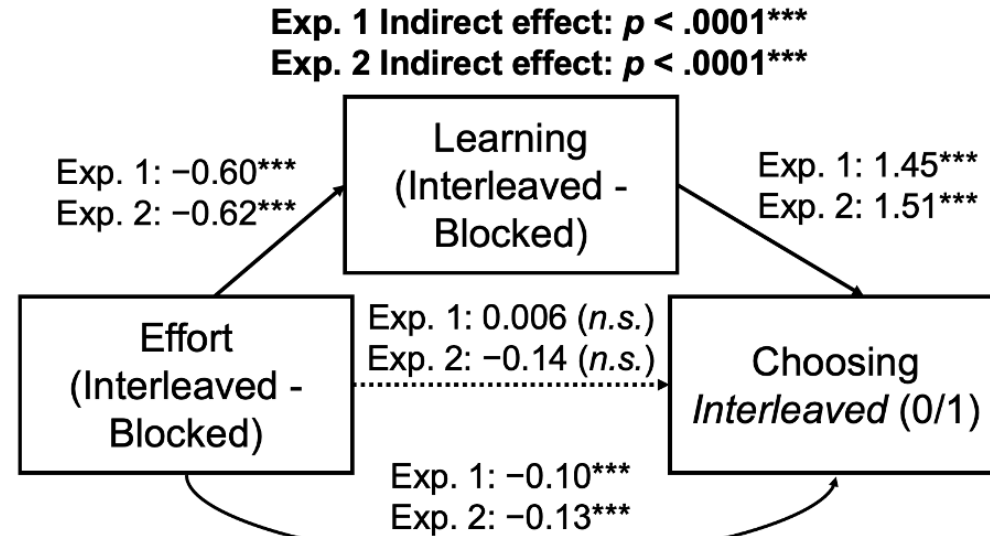
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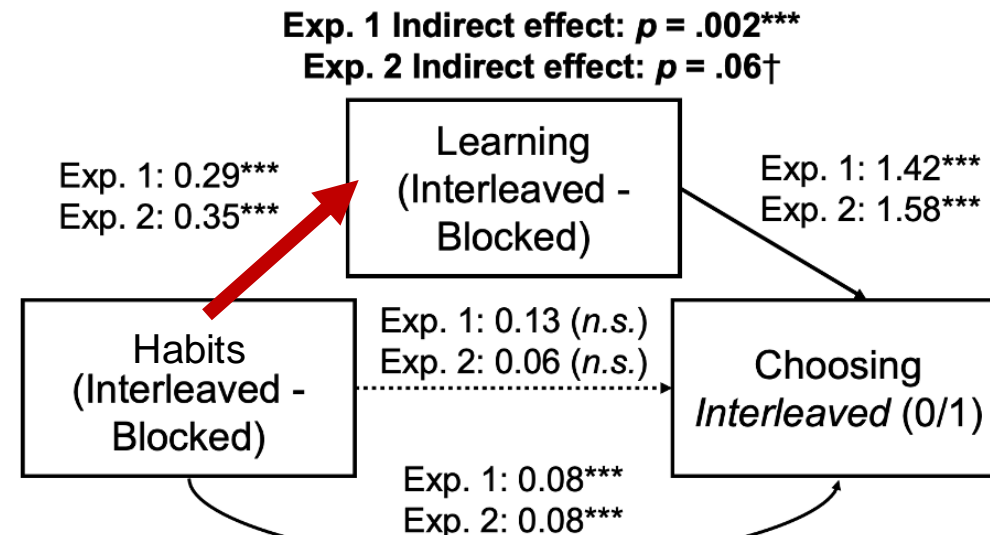


# Results (Immediate Perceptions)

## Indirect Effect of Perceived Mental Effort



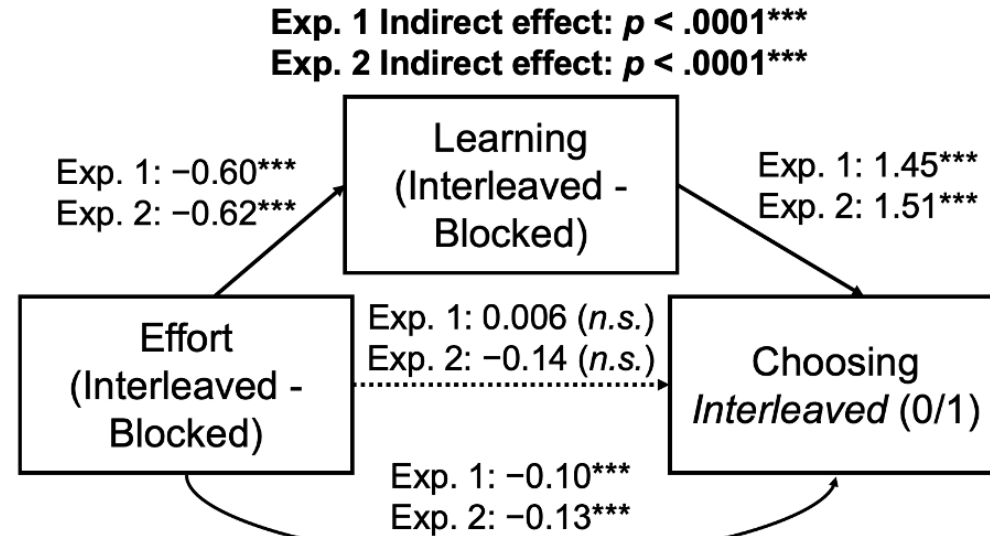
## Indirect Effect of Perceived Habits



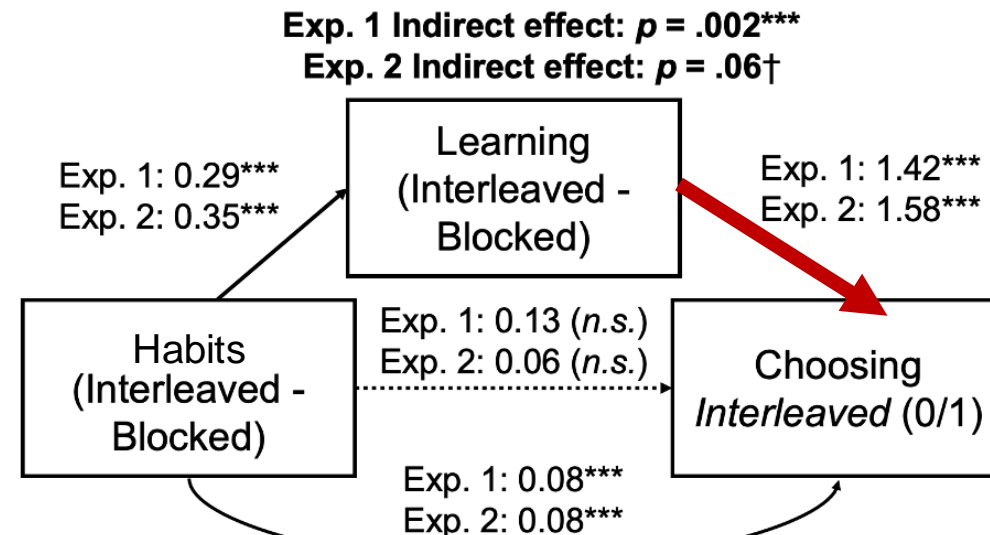


# Results (Immediate Perceptions)

## Indirect Effect of Perceived Mental Effort

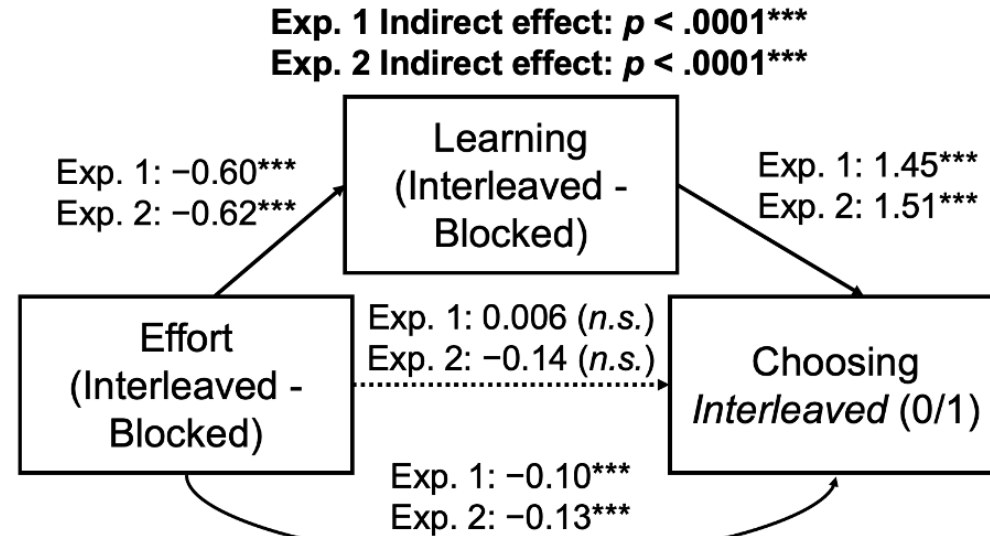


## Indirect Effect of Perceived Habits

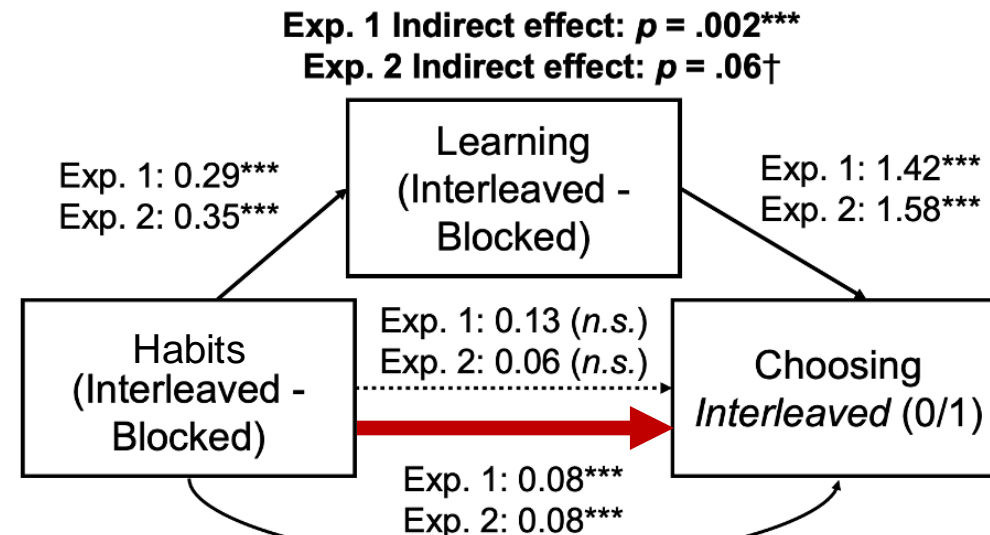


# Results (Immediate Perceptions)

## Indirect Effect of Perceived Mental Effort

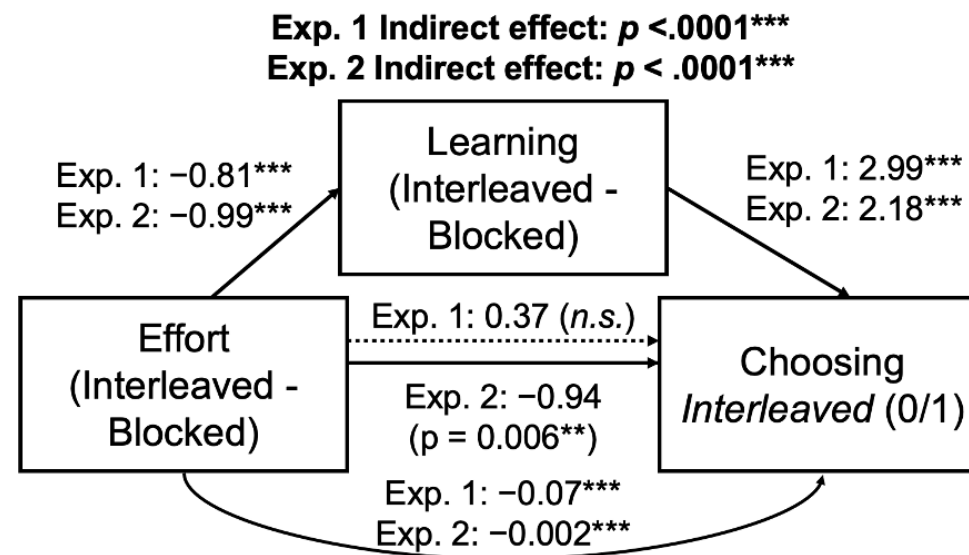


## Indirect Effect of Perceived Habits



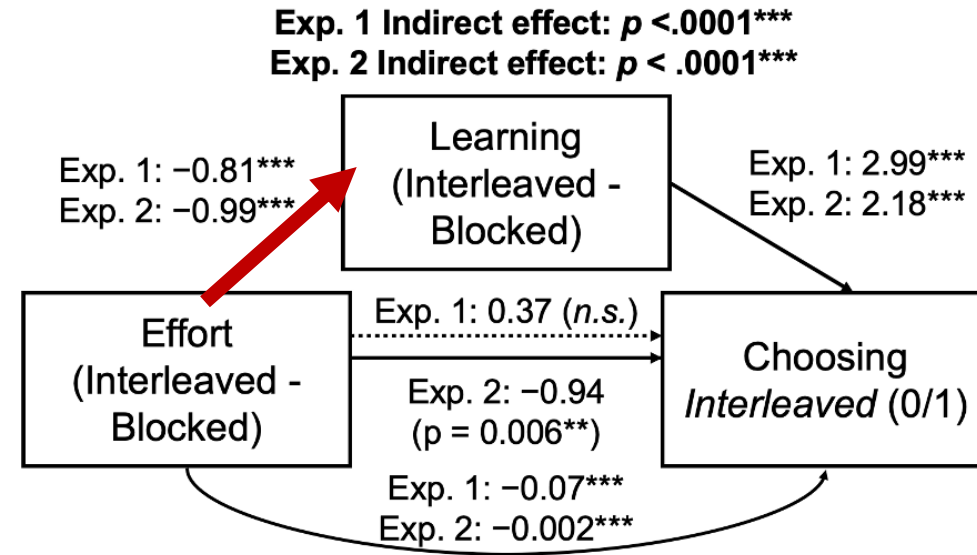
# Results (Retrospective Comparisons)

## Indirect Effect of Perceived Mental Effort



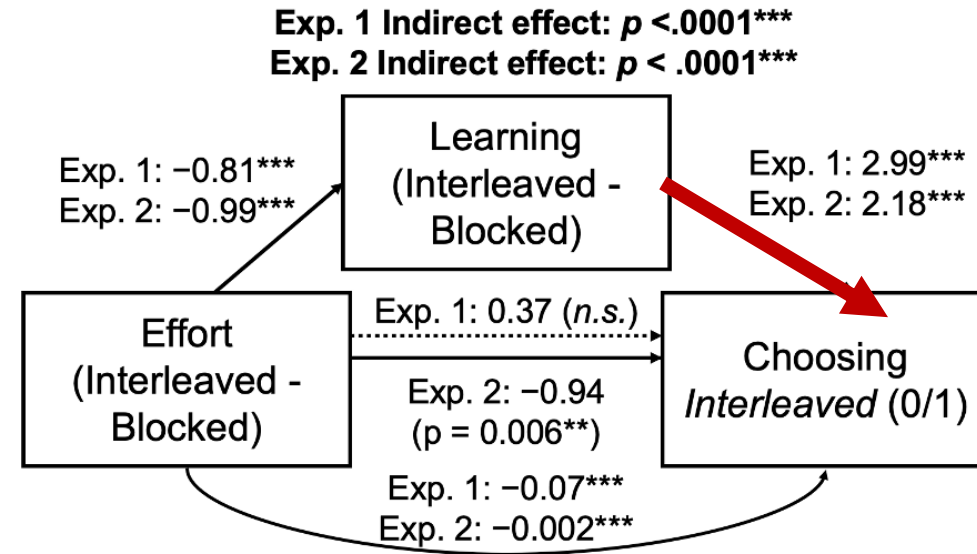
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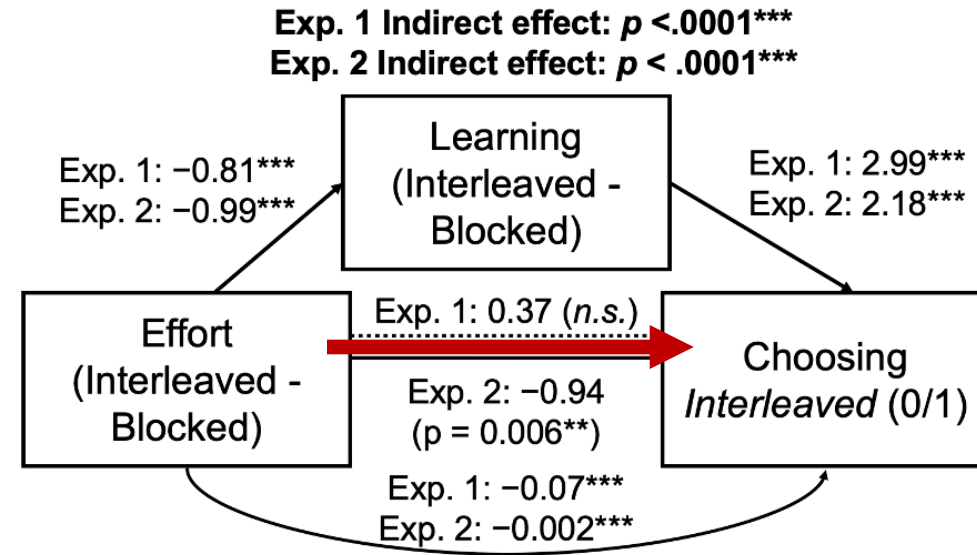
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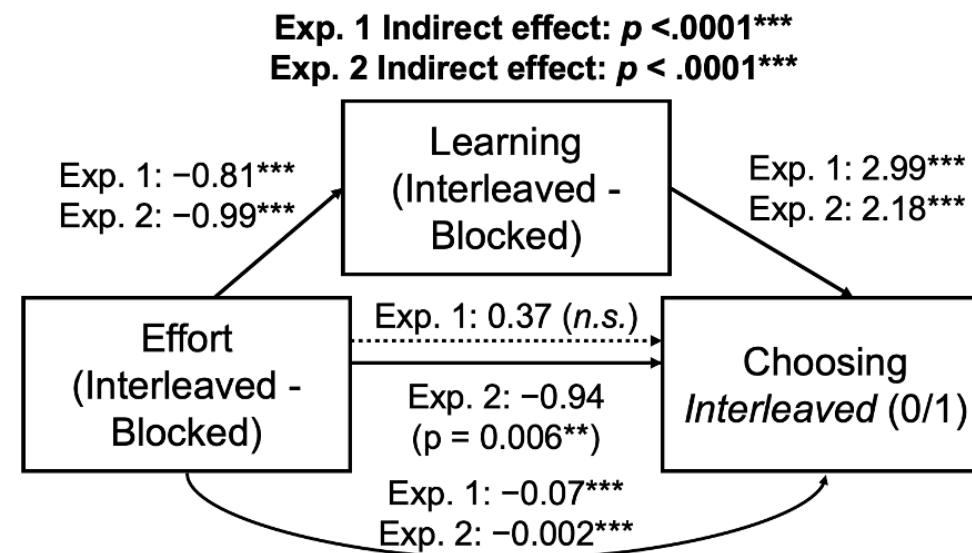
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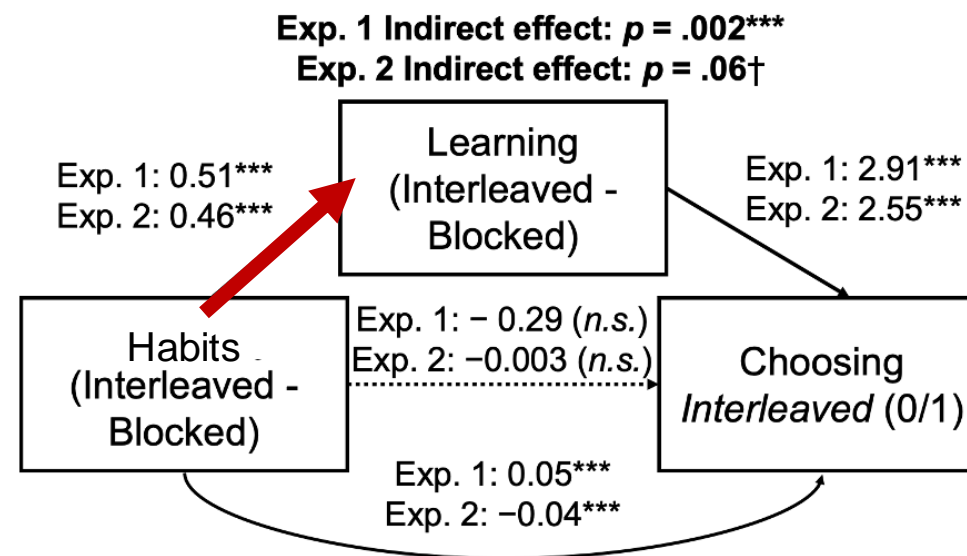


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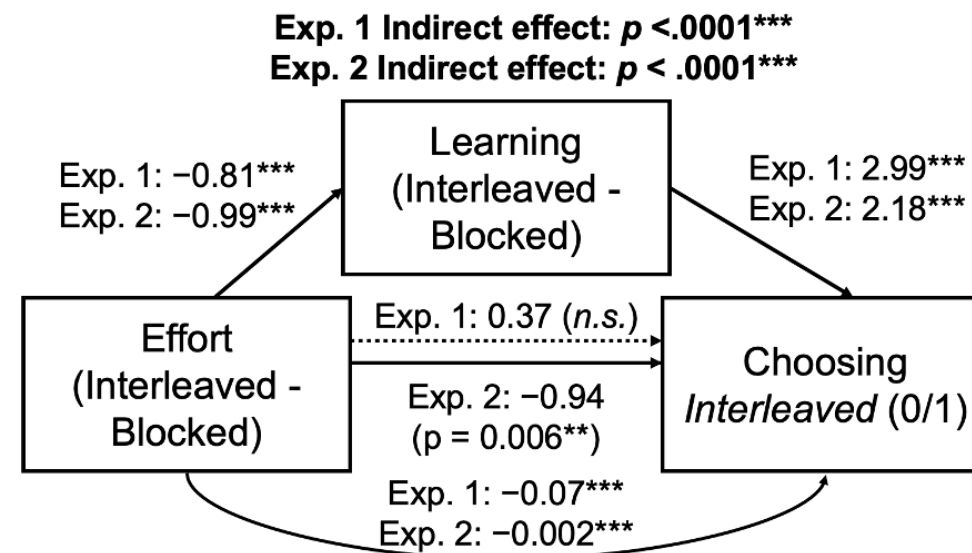


## Indirect Effect of Perceived Habits

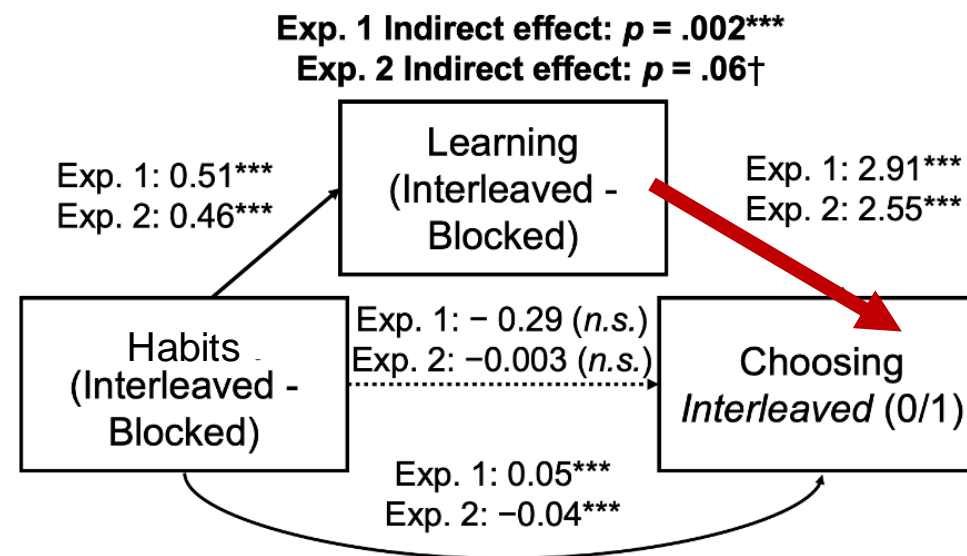


# Results (Retrospective Comparisons)

## Indirect Effect of Perceived Mental Effort



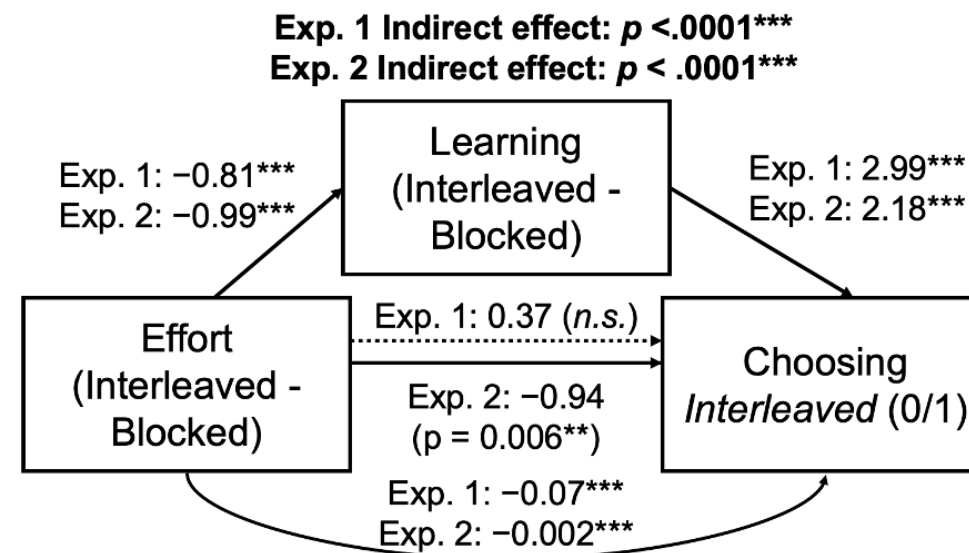
## Indirect Effect of Perceived Habits



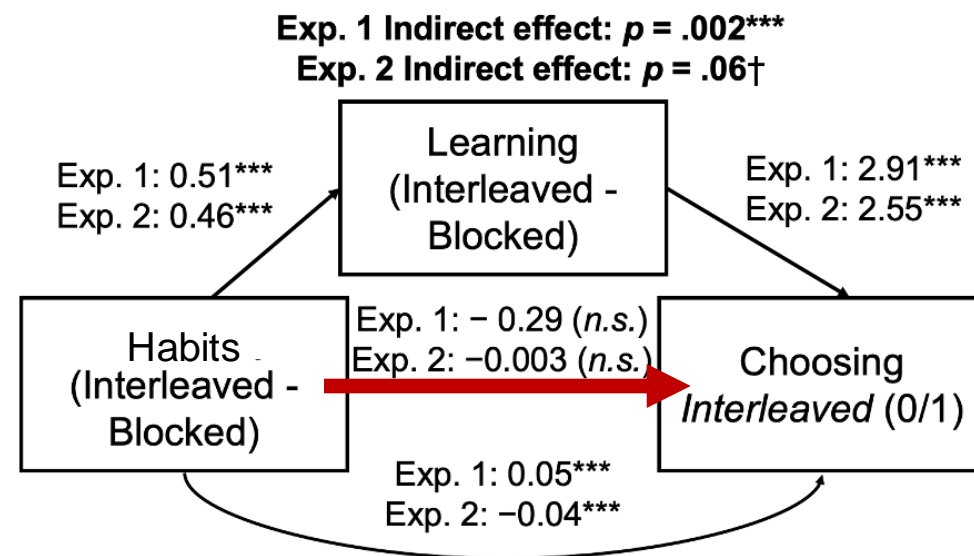


# Results (Retrospective Comparisons)

## 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

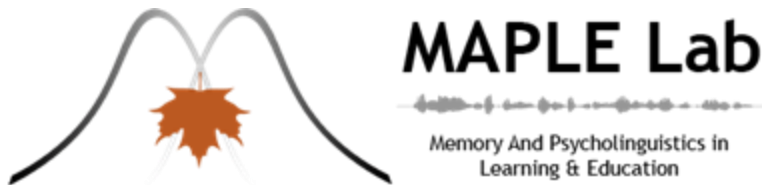
Promote understanding that familiar study habits aren't necessarily the most effective

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>

