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Cognitive Awareness and Study Approach Decision Making

Role: Co-lead Investigator & Data Analyst (2021 – 2023)

Brief Description

The objective of this project was to examine the influence of mental effort and familiarity on learning perceptions and study strategy preferences. This project required large-scale data management in Excel (600+ participants). With my role, I used skills such as survey design, logistic regression, mediations, and *t*-tests.

Problem

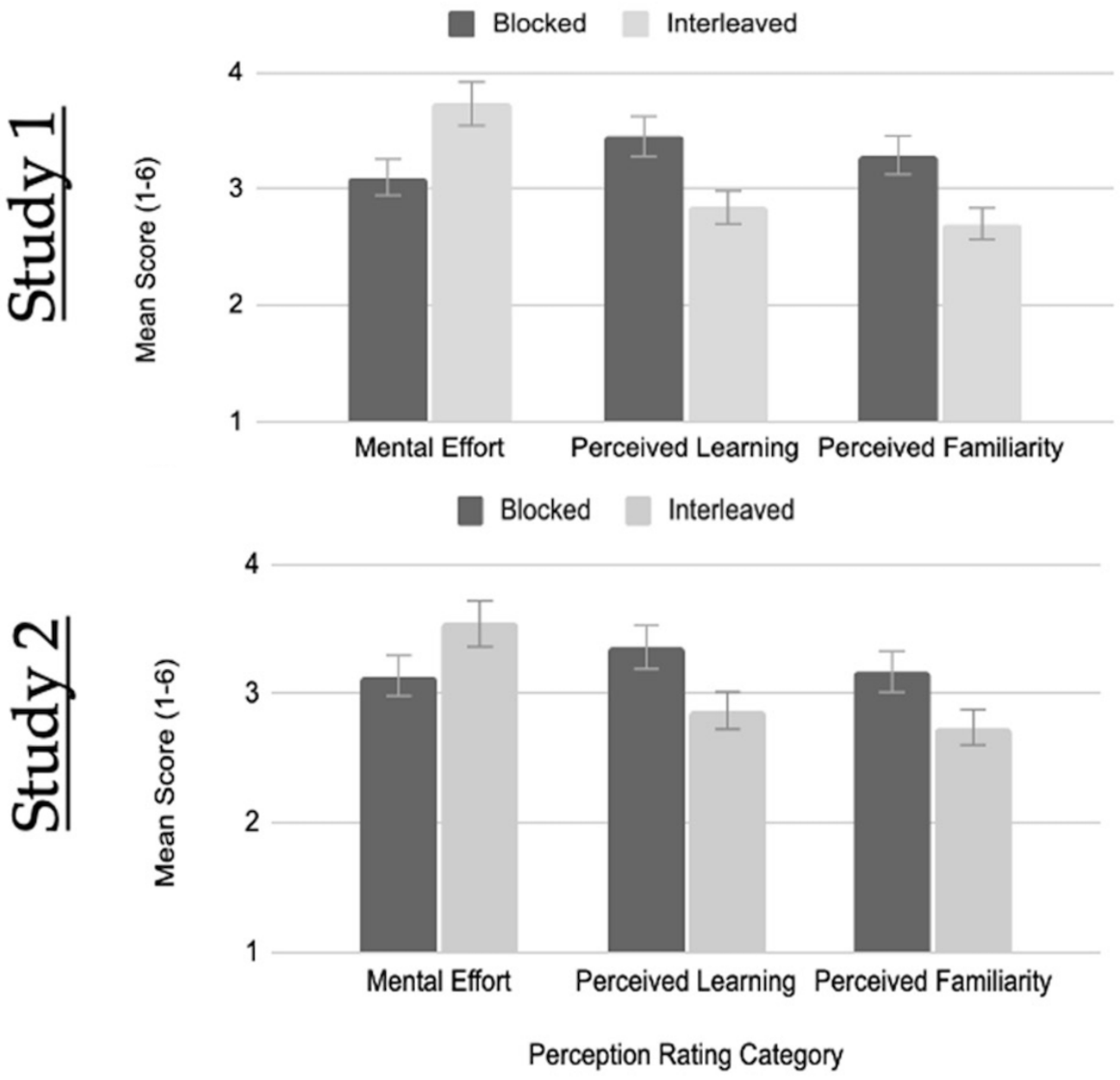
Learners often do not choose ideal study strategies when learning. Past research suggests that learners frequently misinterpret the effort affiliated with efficient strategies as being indicative of poor learning. Expanding upon this past work, I also explored the integration of study habits into this model. Perhaps learners misinterpret the unfamiliarity of efficient strategies as being indicative of poor learning as well.

Design

I conducted two experiments were learners experienced two contrasting study strategies – blocked (grouped together) and interleaved (not grouped together or intermixed) – to learn to discriminate between images of bird families. After experiencing each strategy, learners rated each according to its perceived mental effort, learning, and familiarity. Next, learners were asked to choose which strategy they would use in the future.

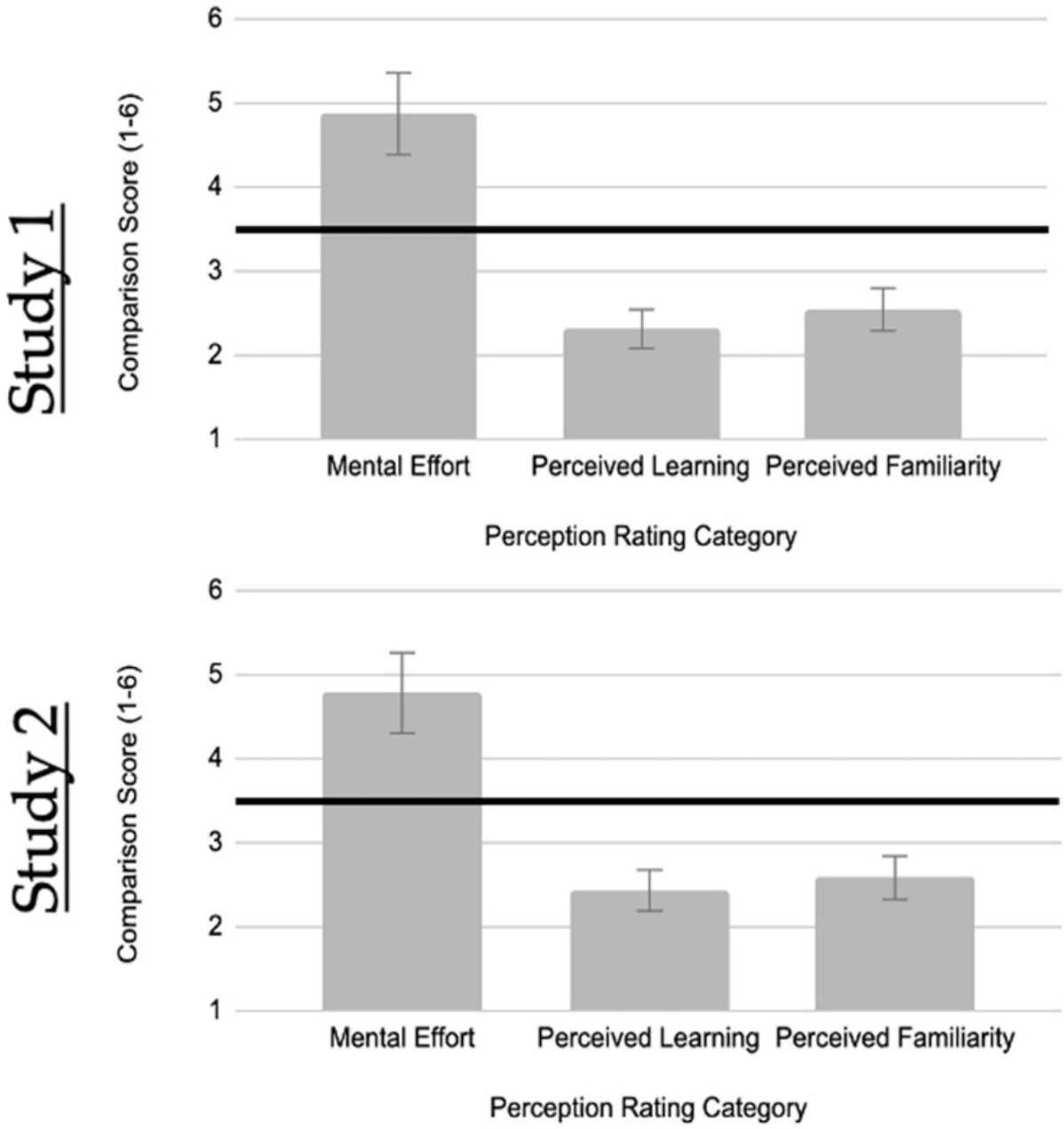
Results

For both studies, when given the opportunity to choose to either use the blocked or interleaved strategy for future use, most participants chose a blocked schedule compared to the interleaved schedule. For both studies, participants perceived the interleaved schedule as being more mentally effortful than the blocked. They also judged the interleaved schedule as less effective for their learning when compared to the blocked schedule. Lastly, they judged the interleaved schedule as being less familiar than the blocked schedule.



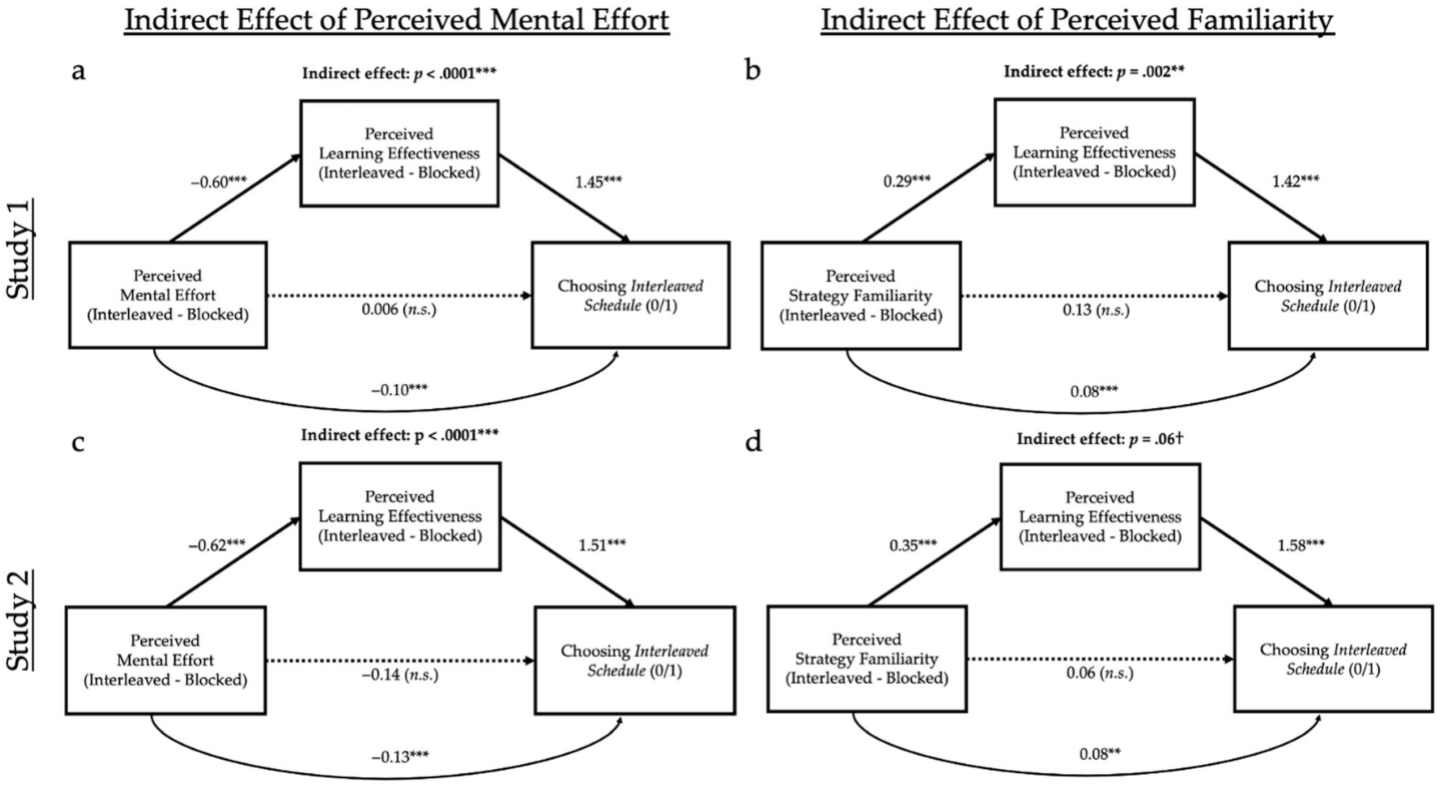
Results (cont.)

For both studies, participants also judged an interleaved schedule as being significantly more effortful than a blocked schedule, as significantly less effective for learning, and as significantly less familiar.



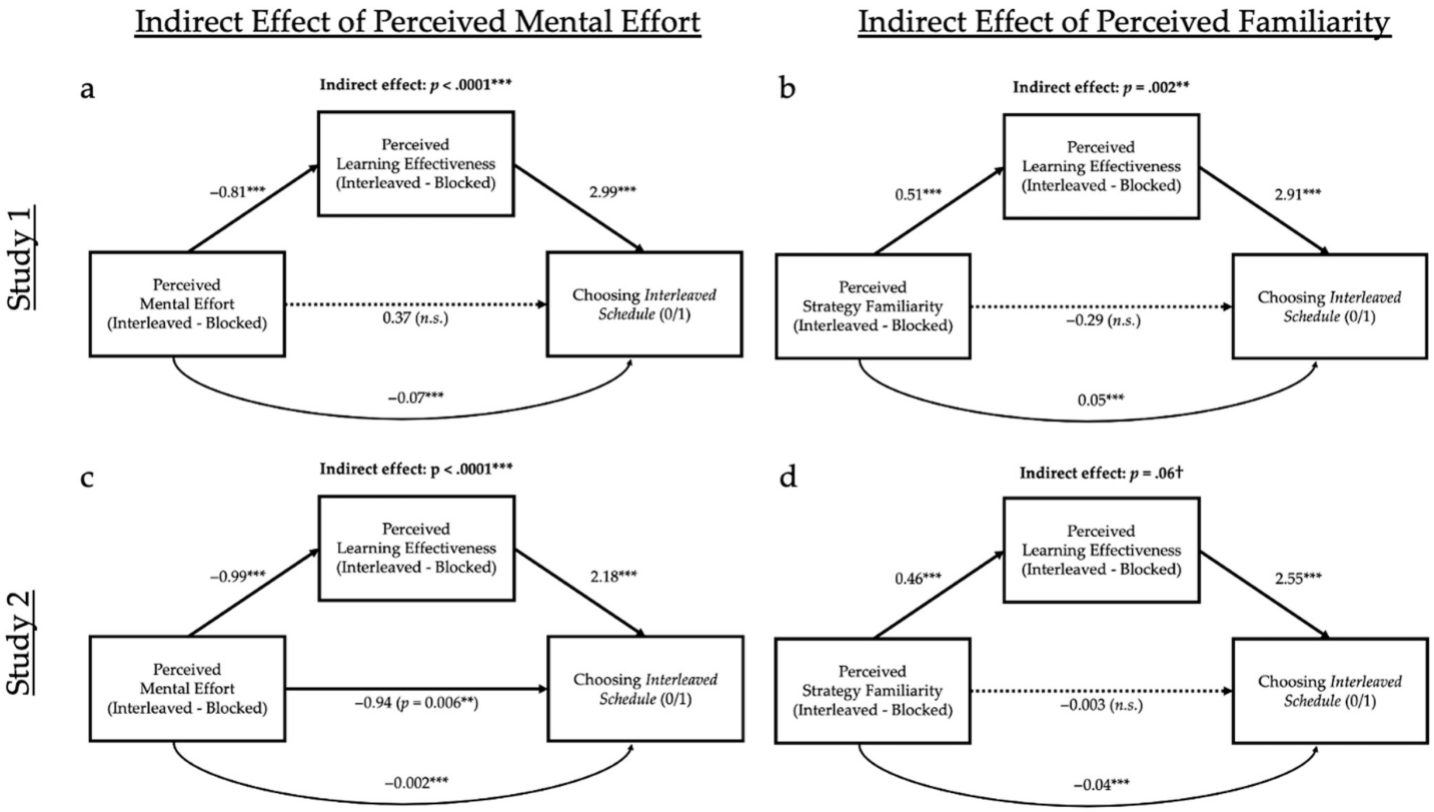
Results (cont.)

For both studies, mediation analyses revealed the more learners perceived interleaving as effortful, the less they perceived they learned, and consequently they were less likely to choose this method. Additionally, the more learners perceived interleaving as being less familiar, the less they perceived they learned, and consequently the less likely they were to choose this method.



Results (cont.)

Further, for both studies, mediation analyses revealed the more learners perceived interleaving as effortful, compared to blocked learning, the less they perceived they learned, and consequently they were less likely to choose this method. Additionally, the more learners perceived interleaving as being less familiar, compared to blocked learning, the less they perceived they learned, and consequently the less likely they were to choose this method.



Results (cont.)

For the learners who choose blocked for future learning, even when learners are explicitly told that interleaving proves to be a superior study strategy, learners still prefer to not switch from blocking to interleaving. Unsurprisingly, for the learners who chose interleaving for future learning, when learners are informed that interleaving is a superior study strategy, most learners prefer to not switch from interleaving to blocking.

Coded Response	Frequency of Response (%)		Example
	Study 1	Study 2	
Originally chose blocked			
Not change strategy	63.7	60.6	"No this does not change my strategy that I would use, it is easier for me to group it together."
Switch to interleaved	20.8	24.8	"Yes, actually. Now that I think about it, studying them not grouped together helped me notice patterns between the types of birds."
Hesitant about switching to interleaved	9.6	8.2	"I think it does, I usually group together but if 90% of people really do learn better without it being grouped together, maybe I should give it a try."
Alternative study strategy	5.4	2.0	"I would personally start out studying with examples grouped together, and then move to examples that are not grouped together."
Originally chose interleaved			
Not change strategy	85.3	80.4	"Having an unexpected pattern makes your brain remember things much better."
Switch to blocked	10.5	16.2	"Yes, I think it will take less of a mental toll to differentiate between topics."
Hesitant about switching to blocked	0.0	0.0	–
Alternative study strategy	1.2	0.0	"I [would] use a different strategy depending on the subject. For math, I think examples that are not grouped together is better, but for topics like biology and chemistry, I enjoy grouping up related topics."

Findings

Learners are making ineffective learning judgments based on their perceptions of mental effort and familiarity and, therefore, do not make use of optimal study strategy decisions in self-regulated learning decisions.