

# What reusable shortcuts do people propose when solving assembly problems?



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We rarely face the same problem twice, but many problems are similar.

## Motivation

1. What patterns do we notice across similar problems?
2. What “shortcuts” do we create based on these patterns?

## Stimuli

**1. glue two pieces together**

**2. generate tangram**  
least efficient most efficient  
one tangram has multiple solutions

**3. repeat (x30)**  
shared patterns

**4. generate more**  
highly structured

**5. generate without enforcing pattern**  
less structured

## Task

**Study**

What patterns do you notice?  
Type answer here...

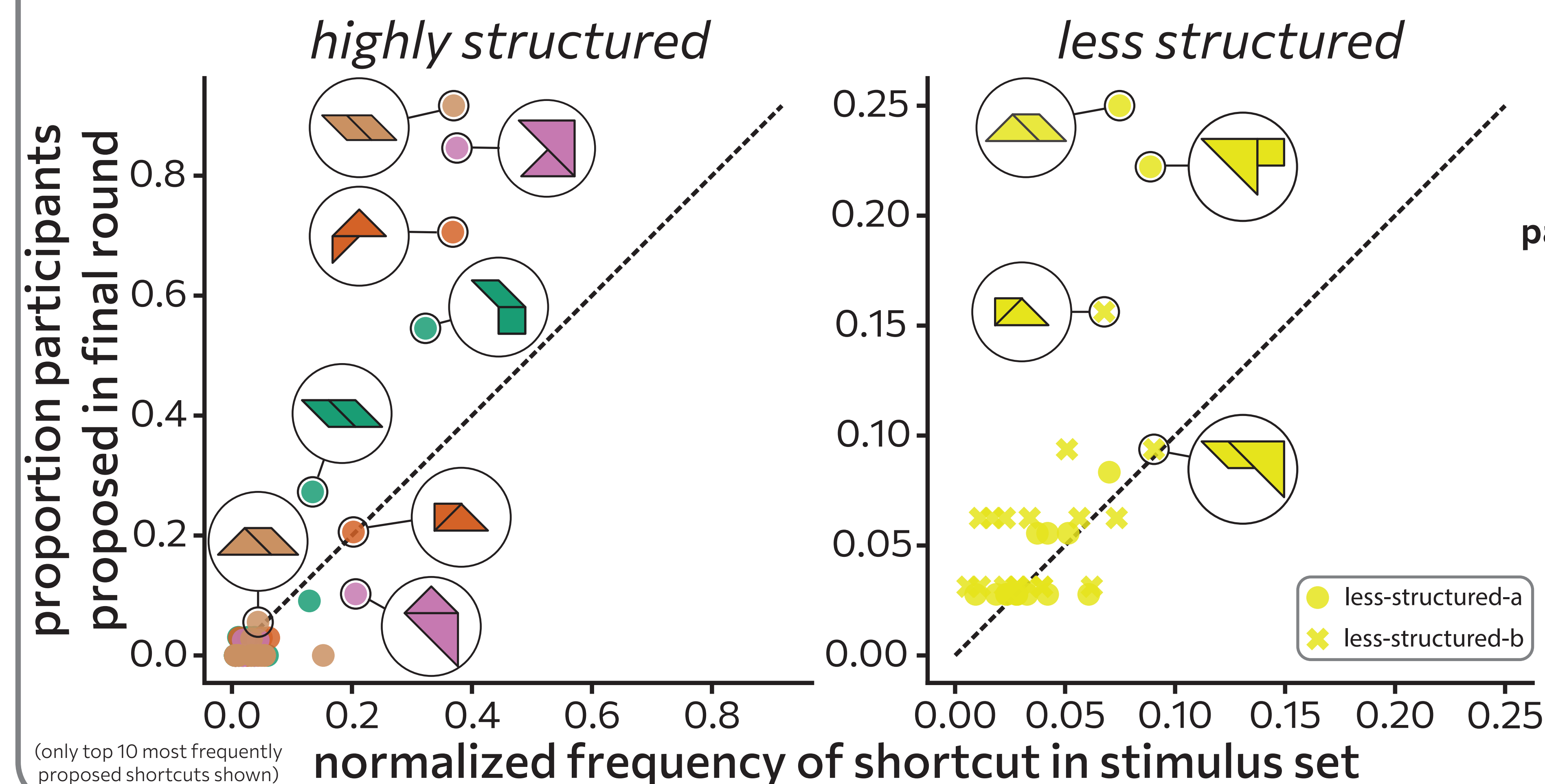
**Assemble**  
build those shapes!  
4m59s remaining...

**Prepare shortcut**  
repeat 6x total

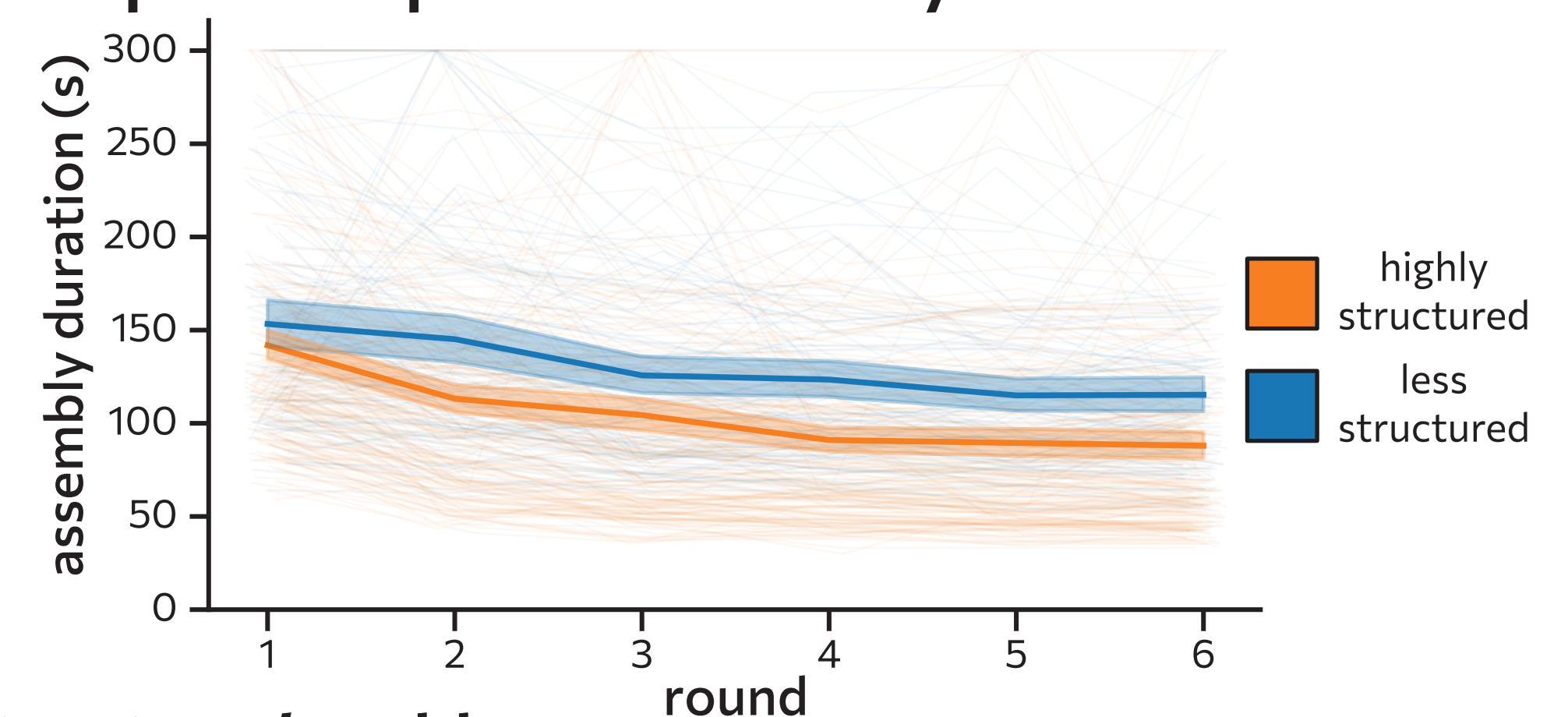
Custom shortcut is available in next round!

## Exp 1: What shortcuts do people propose? N=301

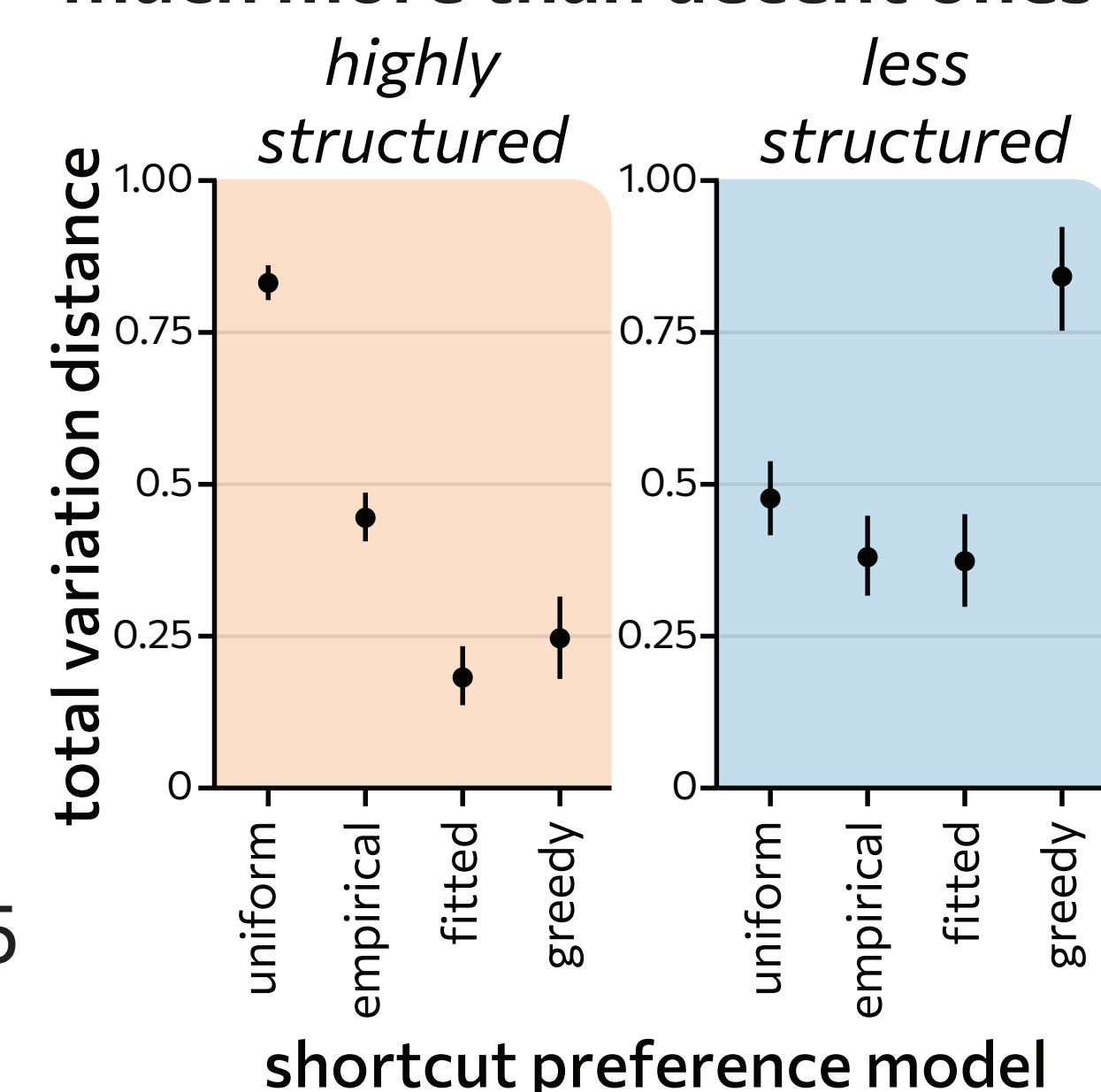
The more frequently a shortcut appeared in assembly problems, the more participants proposed that shortcut



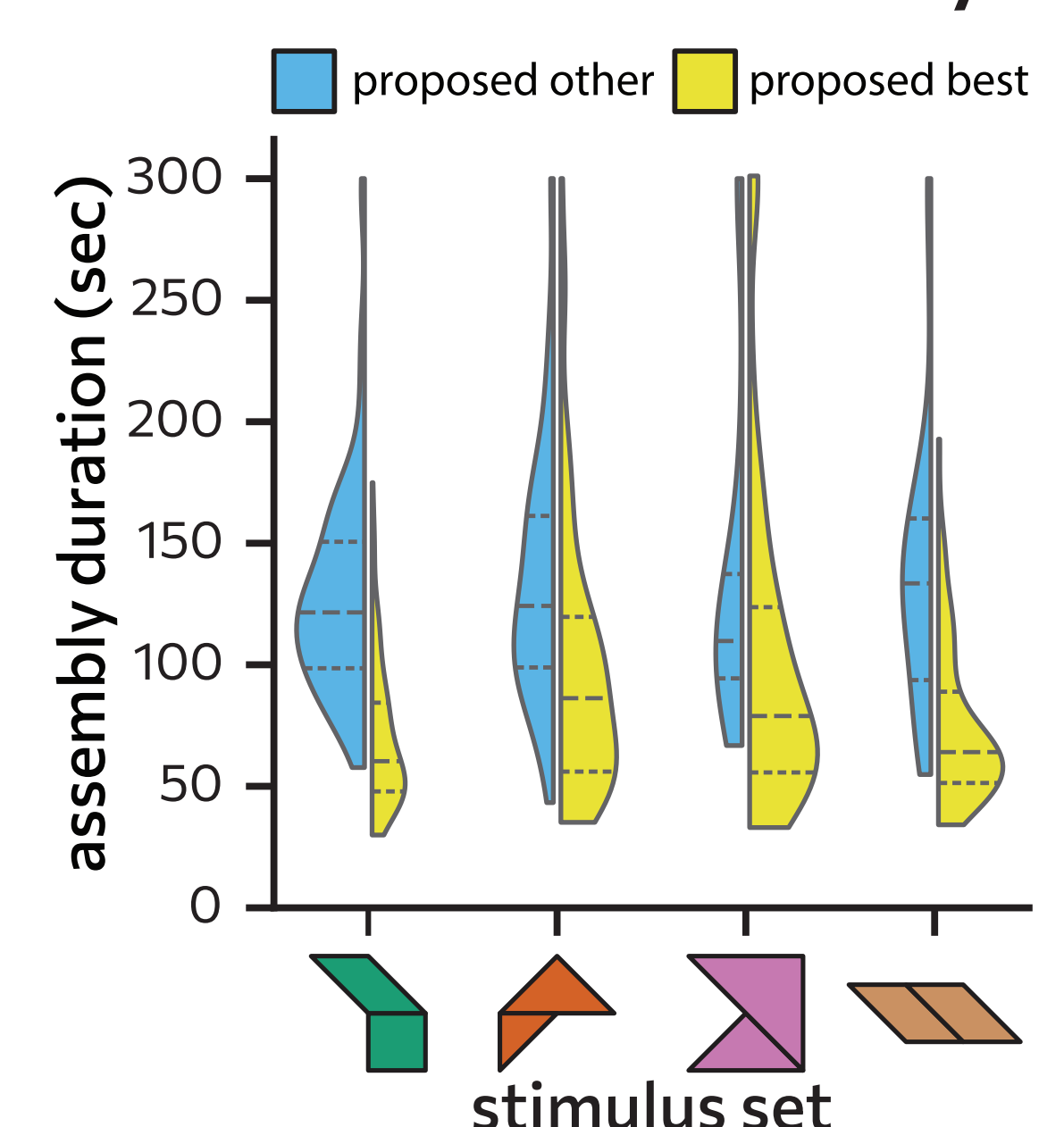
Participants improved assembly time over rounds



In highly structured problems, participants prefer best shortcuts much more than decent ones



Proposing the best shortcut led to faster assembly



## Exp 2: When is it worth it to invest in a shortcut? N=52

Assemble 1 tangram Receive points Decide to invest

**Task**

1 round:

29s remaining...

Nice job! You earned 100 points!

Would you like to propose a shortcut?  
Yes (spend 100 points)  
No

**Design**

short block 2 rounds

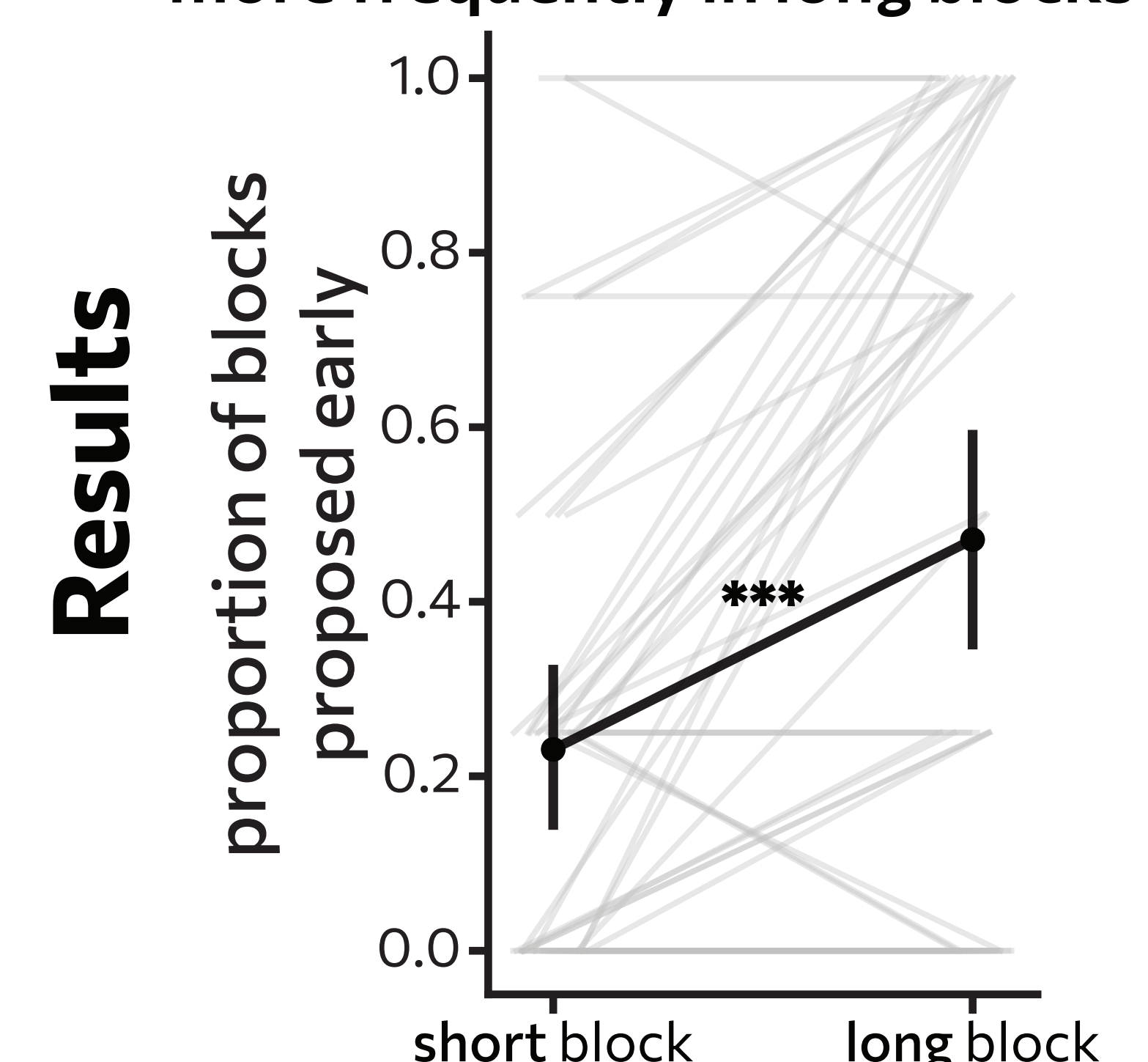
long block 8 rounds

short block 2 rounds

long block 8 rounds

8 blocks total

Participants proposed shortcuts more frequently in long blocks



## Conclusion

People invest in shortcuts that reflect common patterns across problems. But they tend to make them only when the benefits outweigh the costs.

