

# Deploying a Model-based Adaptive Fact-Learning System in a University Course

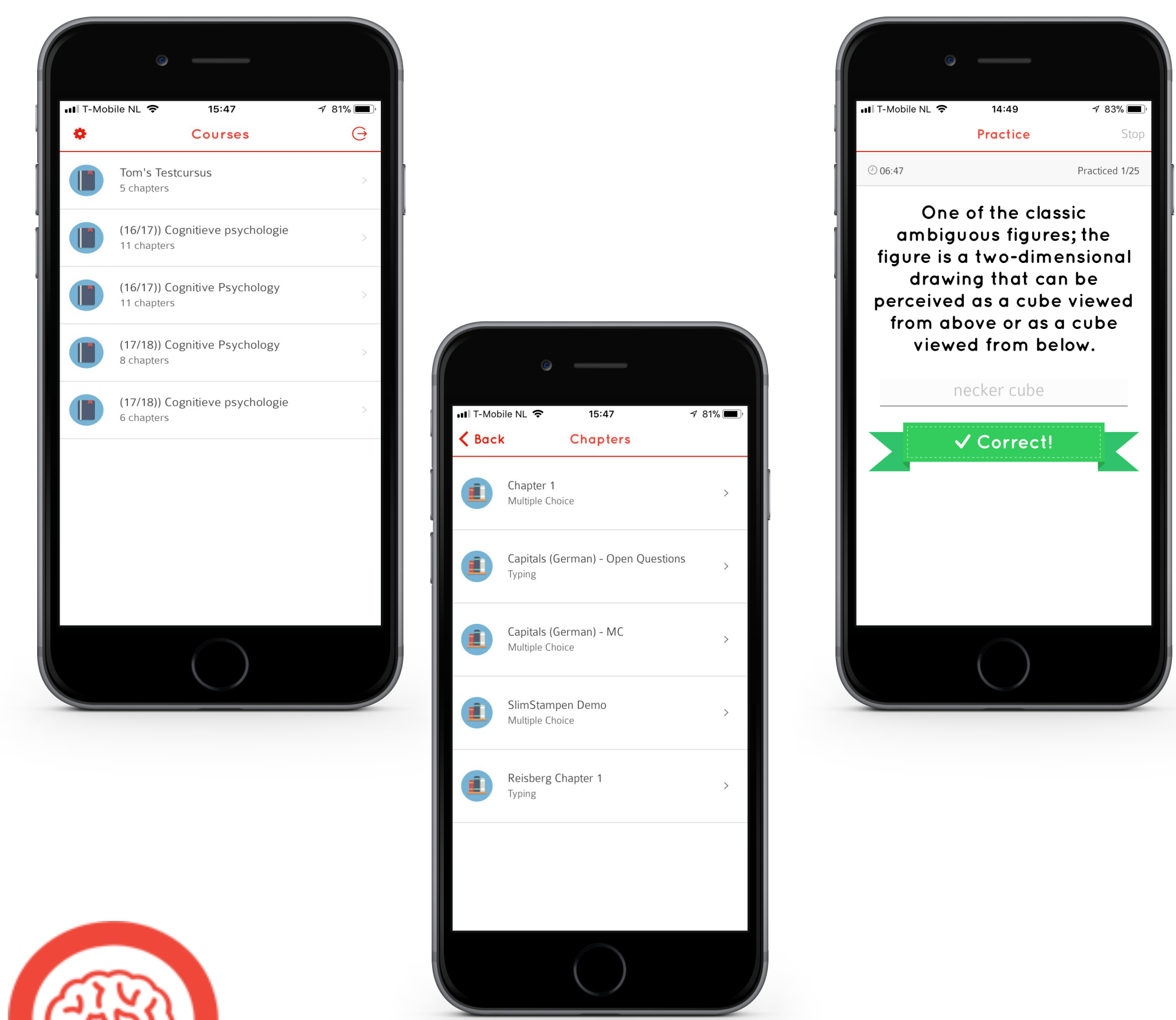
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## Background

Model/theory

This still needs to be filled with information.

The app



The study material was made available through the Blackboard environment. Students could use their web browser or a corresponding iOS/Android app to access the material any time.

Using the app was optional. Material was made available chapter-by-chapter



Rugged Learning

Sample

Cognitive Psychology is a third-year elective course in the Psychology undergraduate program at the University of Groningen. In the 2017/18 cohort, students could study relevant material from each chapter in the textbook using the Rugged Learning system.

**Complete sample:**

338 enrolled students  
286 took the exam  
269 used the system  
456,099 recorded trials

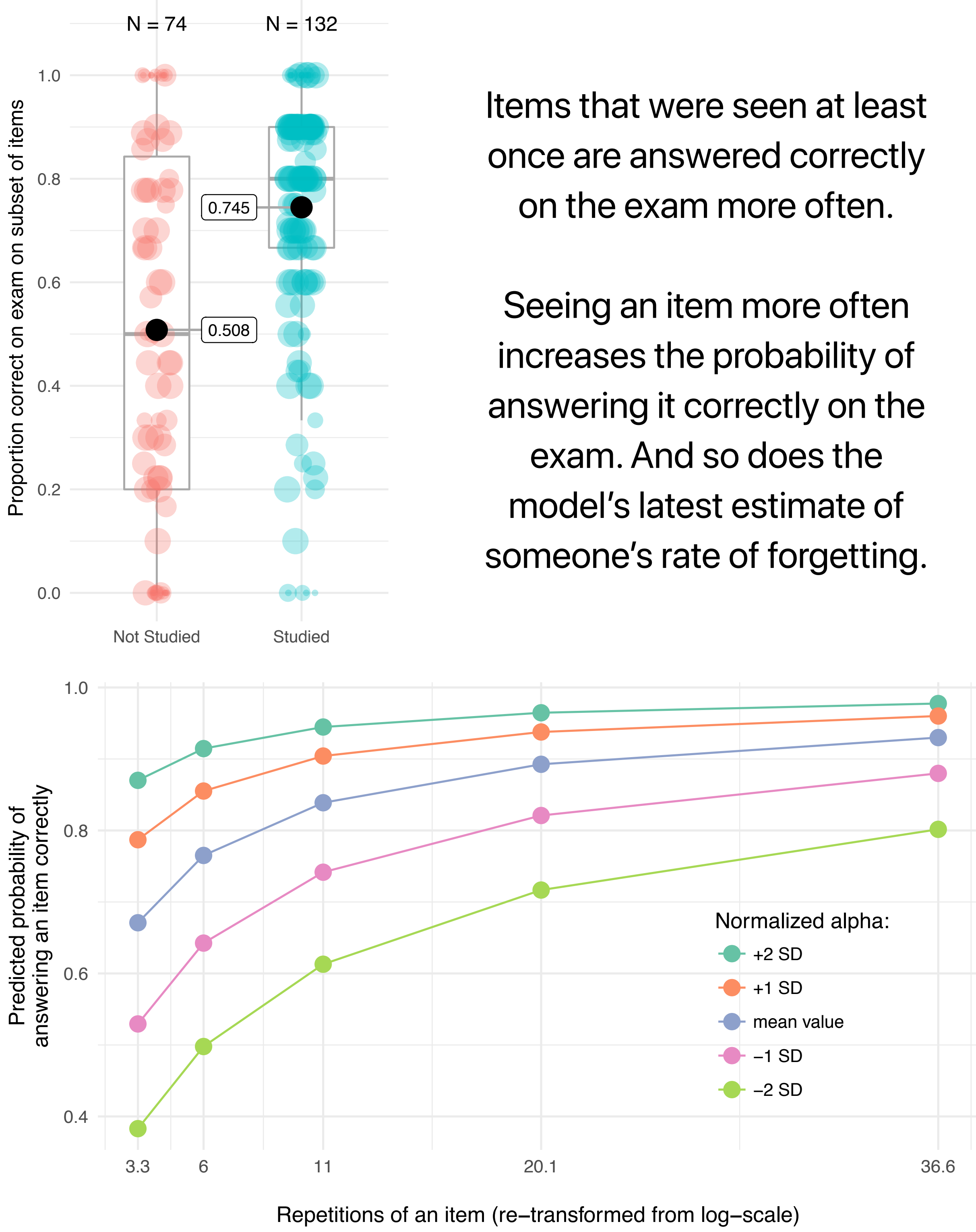
**Data used:**

156 students gave consent (46.2%)  
147 took the exam (51.4%)  
138 used the system (51.3%)  
262,978 recorded trials (56.7%)

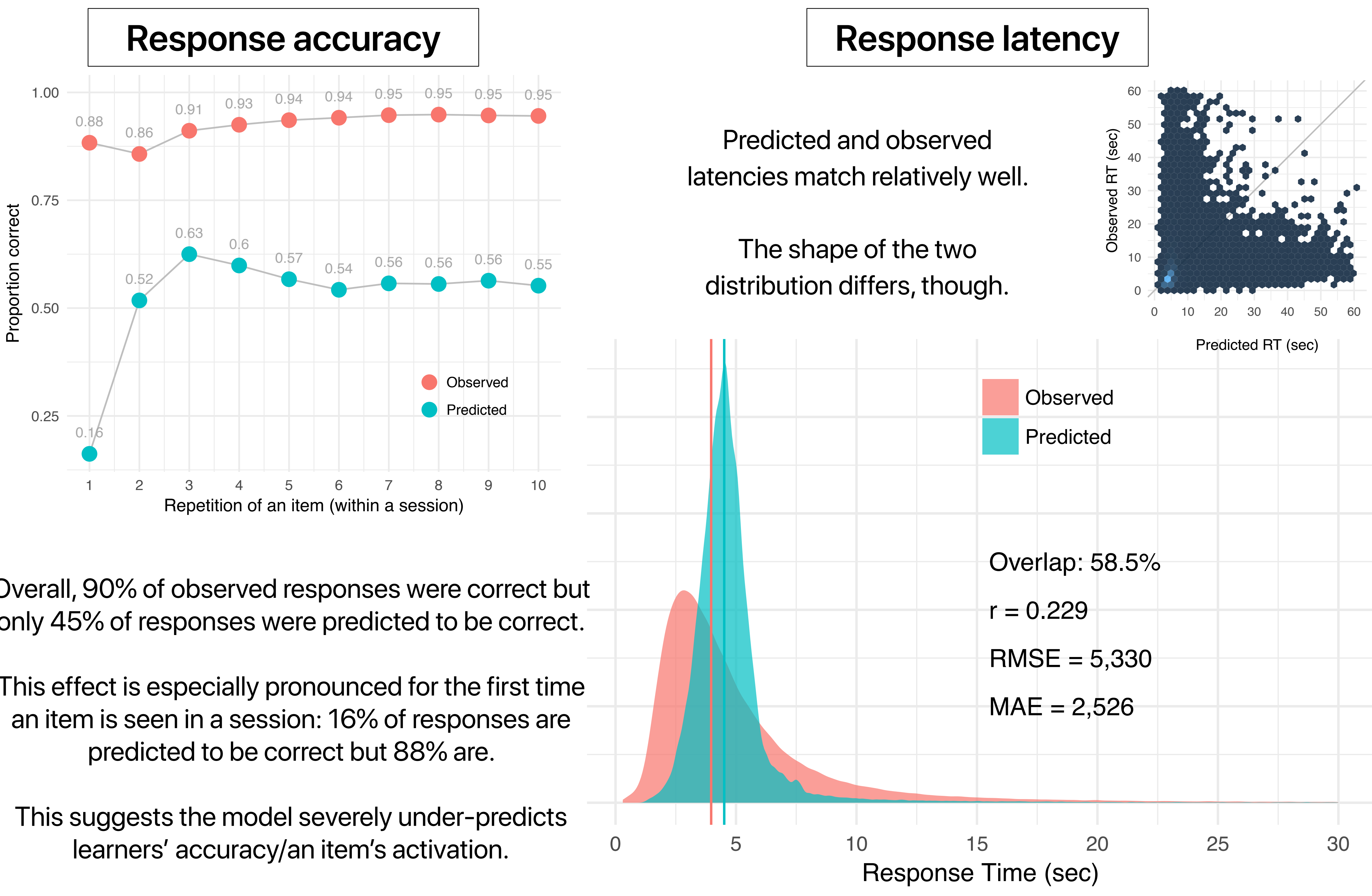
The final exam contained 10 open questions chosen from the Rugged Learning item set.

## Does it work?

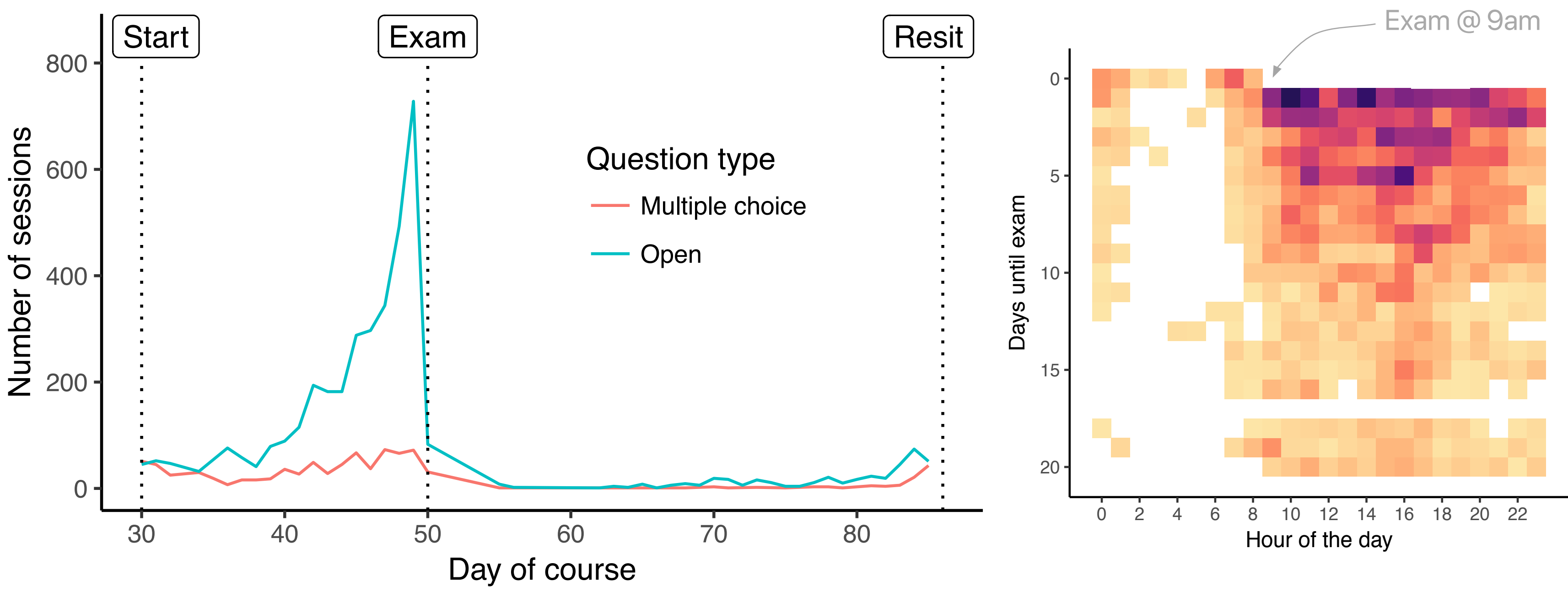
### Item-level exam performance



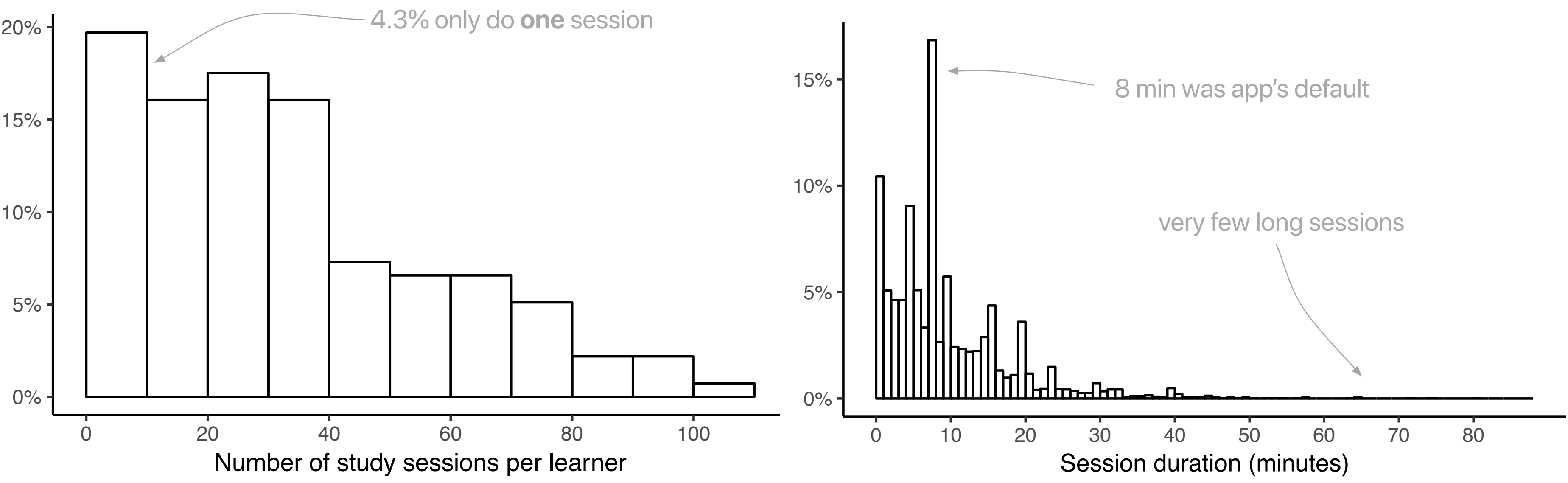
### Model predictions vs. actual behavior



## When and how is it used?



Students mostly study right before the exam. 16.9% of sessions are on the last day.



## Conclusions

- Items studied with the adaptive system are more likely to be answered correctly on the exam. Repeating items more often during practice makes recall on the exam more likely. Estimated model parameters also predict item-level exam performance.
- Students tend to mass rather than space their practice sessions. Usage of the system ramps up just before the exam.
- Study sessions are usually rather short. Students tend to finish the sessions they start.
- The model underestimates the activation of items. Especially when time elapses between sessions.
- Students prefer to practice with open questions rather than multiple choice questions. Students knew that questions on the exam would be open.



More information? See [www.github.com/XXX](https://www.github.com/XXX) for scripts etc.  
Get in touch: [f.sense@rug.nl](mailto:f.sense@rug.nl), [m.a.van.der.velde@rug.nl](mailto:m.a.van.der.velde@rug.nl), [d.h.van.rijn@rug.nl](mailto:d.h.van.rijn@rug.nl)