Should We Give Learners Control Over Item Difficulty?

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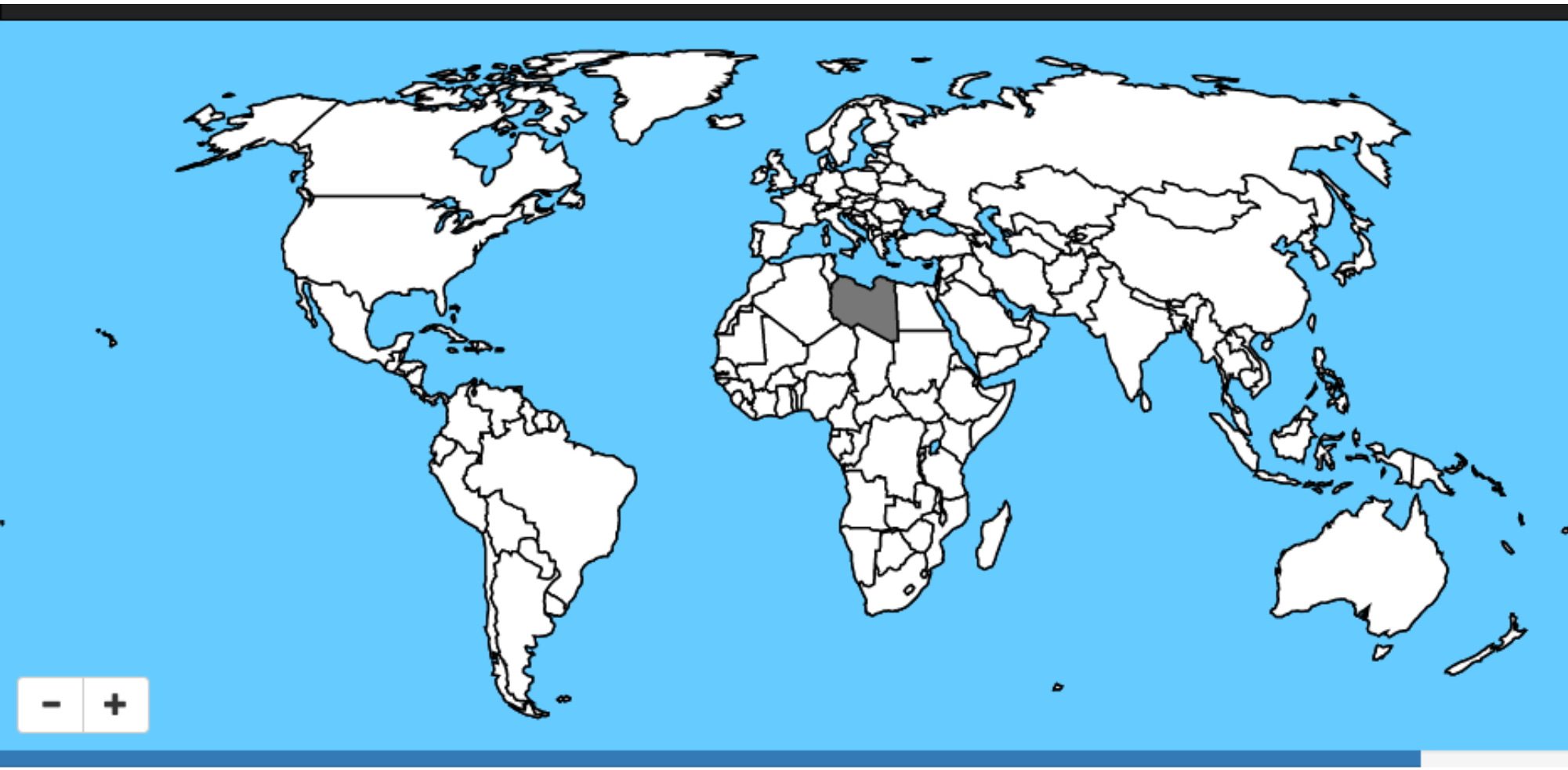

What is highlighted?

Argentina | Greenland | Libya | Don't know | Continue

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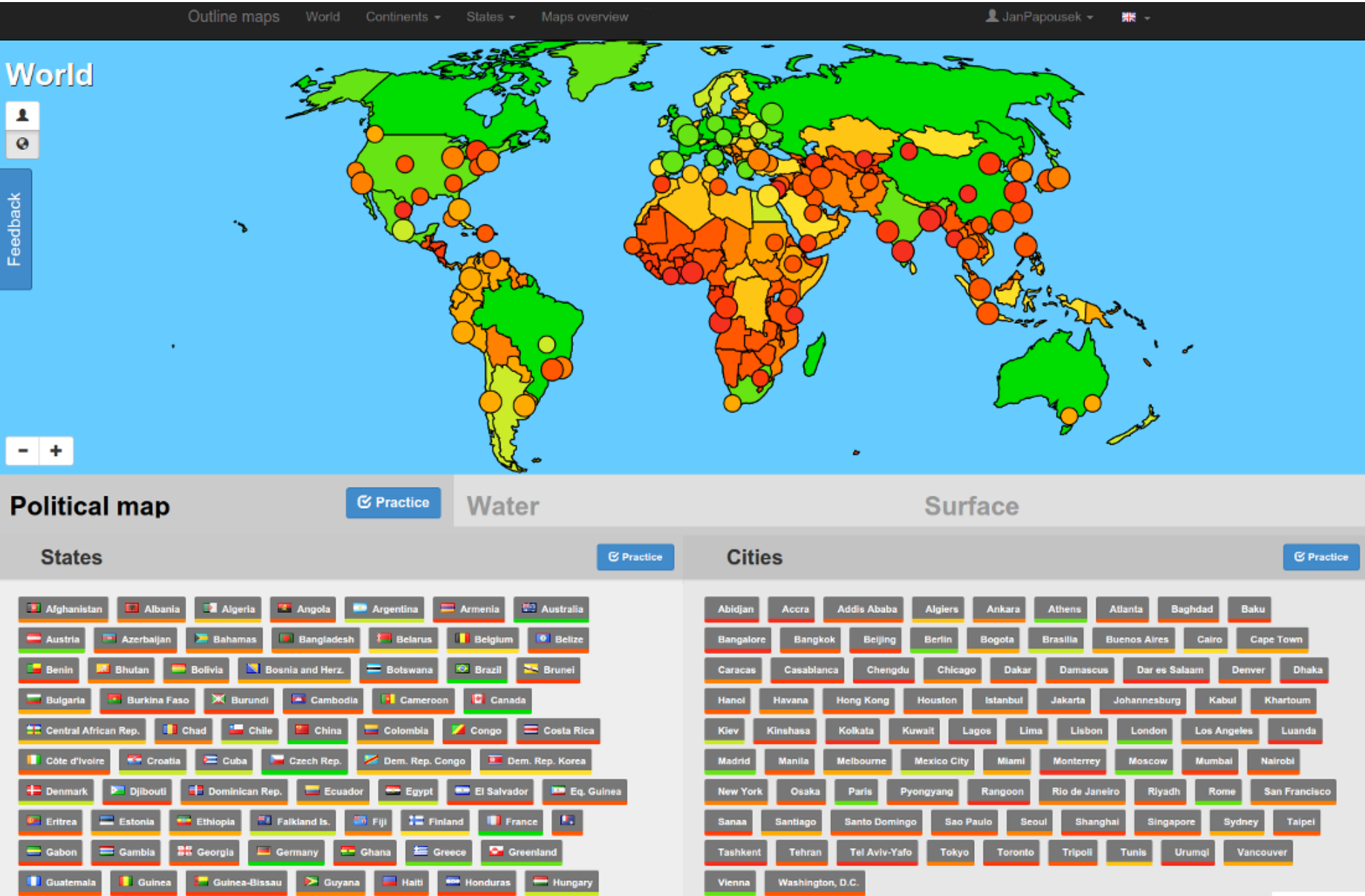


Questions of Suitable Difficulty

- data on performance $\Rightarrow$ learner modeling $\Rightarrow$ estimate of knowledge
- estimate of knowledge $\Rightarrow$ choice of suitable question
- target difficulty of questions
  - previous experiment
  - best results for 35% error rate

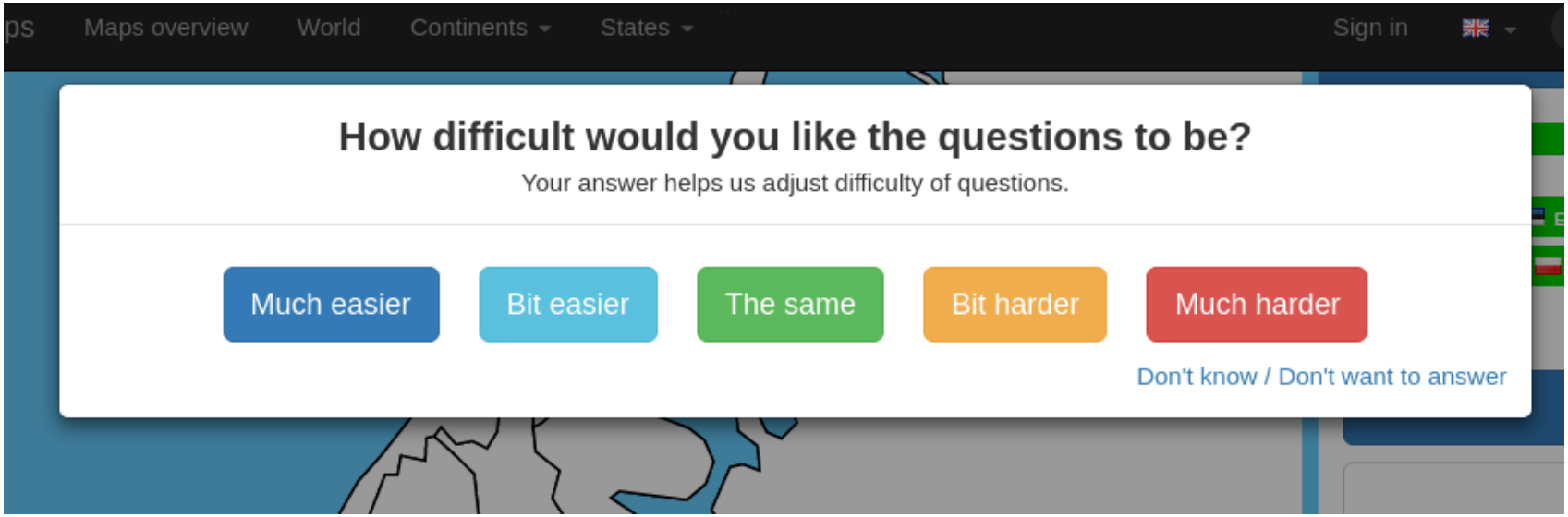
Idea

Give learners control over target difficulty.

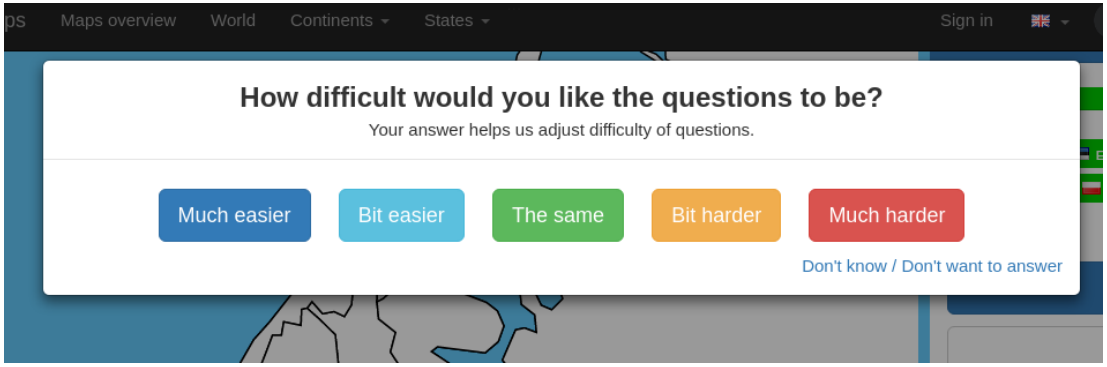
- research question: is it beneficial?
- specific version of more general problem: giving users control vs automatic decisions
- closely relevant previous experiment: Math Garden, this experiment much larger (millions of answers)

Realization

practice divided into series of 10 questions

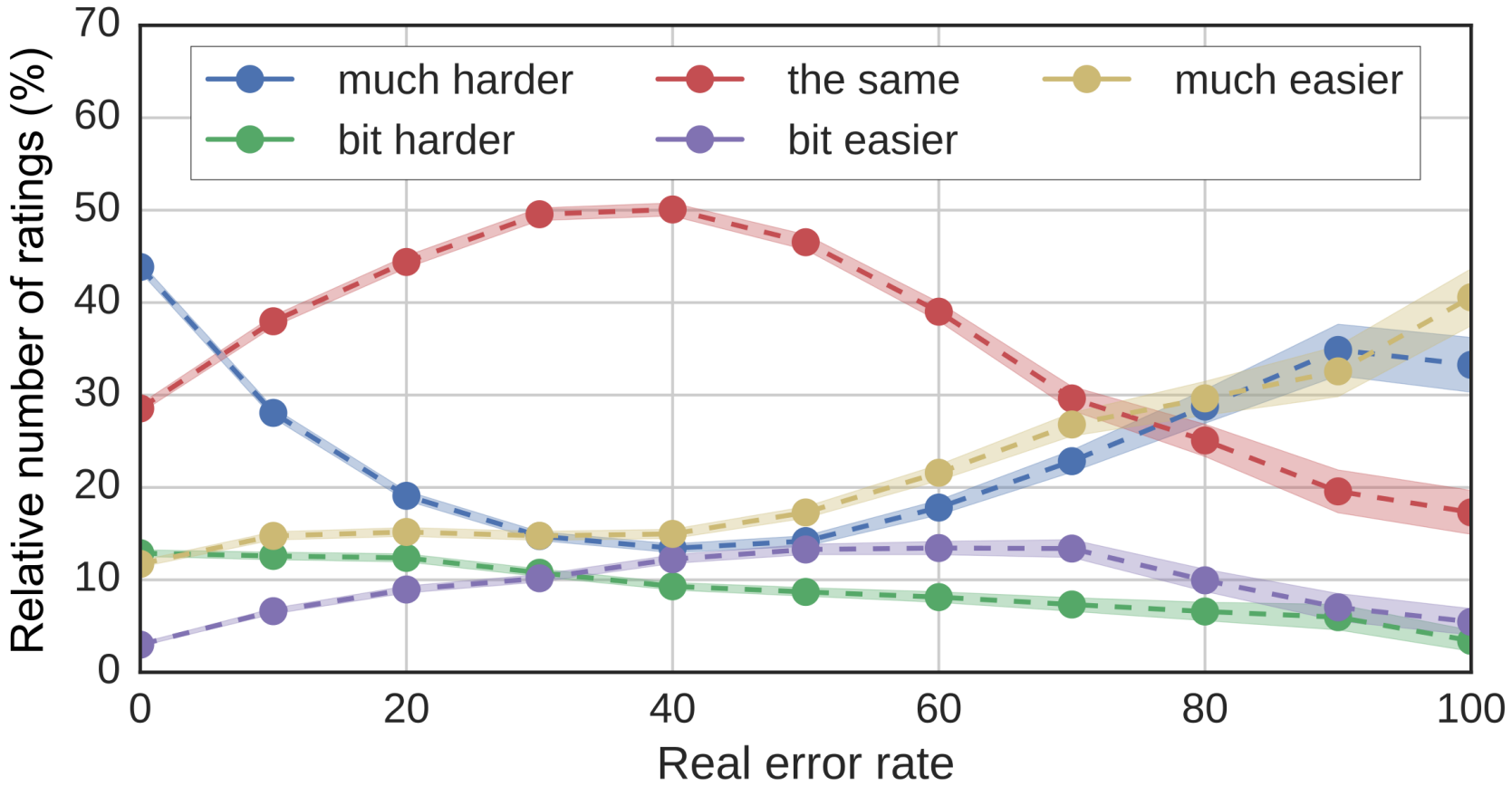


Experimental Conditions



- **normal** – no dialog box
- **placebo** – dialog box, without effect
- **adjustment** – dialog box with effect

Ratings

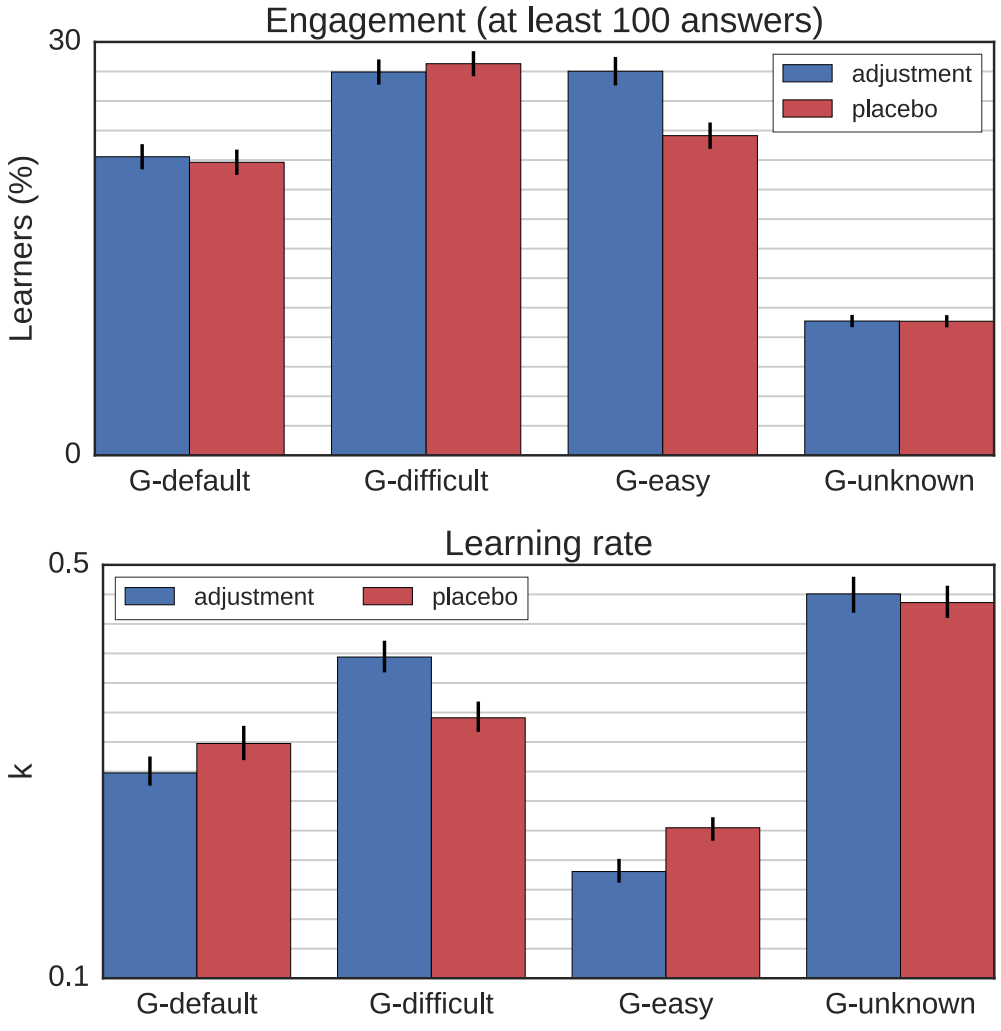

much harder
the same
much easier
bit harder
bit easier
Relative number of ratings (%)
0
10
20
30
40
50
60
70
0
20
40
60
80
100
Real error rate

Engagement and Learning

overall results: small differences among conditions

- engagement: dialog box reduces engagement, adjustment not sufficient to overweight this disadvantage
- learning: no significant differences

Disaggregated Results



Summary

- overall: giving learners control over question difficulty not beneficial
- warning for similar research: presence of irony in learners' responses

Issues for Discussion

- circumstances under which it is beneficial to give users control over settings
- specific hypotheses for experiments
- irony in user responses