On the Effect of Gamification on Stress in Team-Based Situations

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PROBLEM

Does gamification increase the level of stress on people in team-based situations?

Does gamification have a negative impact on a person's morale?

Besides the positive side, does it also add unnecessary pressure on people?

Can the drive to perform better increase anxiety and tension between team members?

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Study 1

[Riivar et al., 2021: Learning Teamwork]

Experiment finds: students' evaluation of team performance were largely performance-driven; they tended to interpret team efficiency as a measurement of good teamwork

Study 2

[Sailer et al. 2017 :How gamification motivates]

Describes a positive impact on participation and learning might result from the competition that leaderboards cause, which can put social pressure on players to engage at higher levels

Study 3

[Hammedi et al., 2020]

Claims that gamification techniques may lead to stress and disengagement, lowering employee well-being and performance, particularly when these mechanisms are not combined with suitable management

Background research

As most of the papers claim the competition factor provided by gamification is actually increasing performance, but only few mention the side effects of it.

Hypotheses

H1

Applying elements of gamification in cooperative co-dependent situations correlates with an increase in self-reported stress levels of present participants.

H2

Applying elements of gamification in cooperative co-dependent situations correlates with a decrease in time spent on each task.

H3

Applying elements of gamification in a cooperative co-dependent game negatively correlates with the percentage of questions a users gets wrong

Procedure

Pre-test questionaire

- Demographical data
- Survey on general stress ratings

Post-test questionaire

- Survey on stress during the test

Short interview

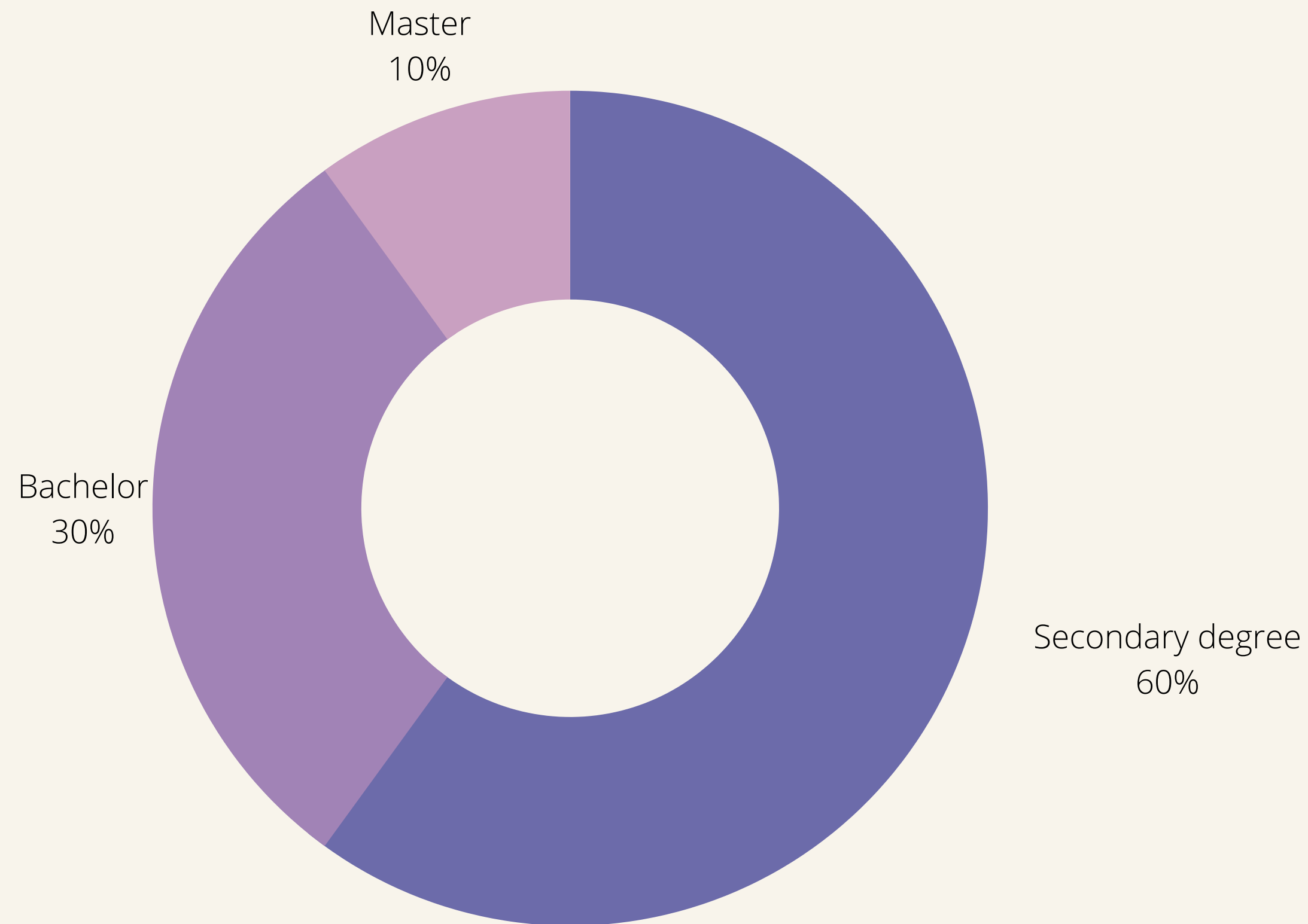- Asking people on their thoughts during the test

Test

- 20 questions of varying difficulty
- Simulated teams
- One group got notifications on some questions
- Asked everyone to give quick and correct answers

⚠ Your team-mates are waiting for you.
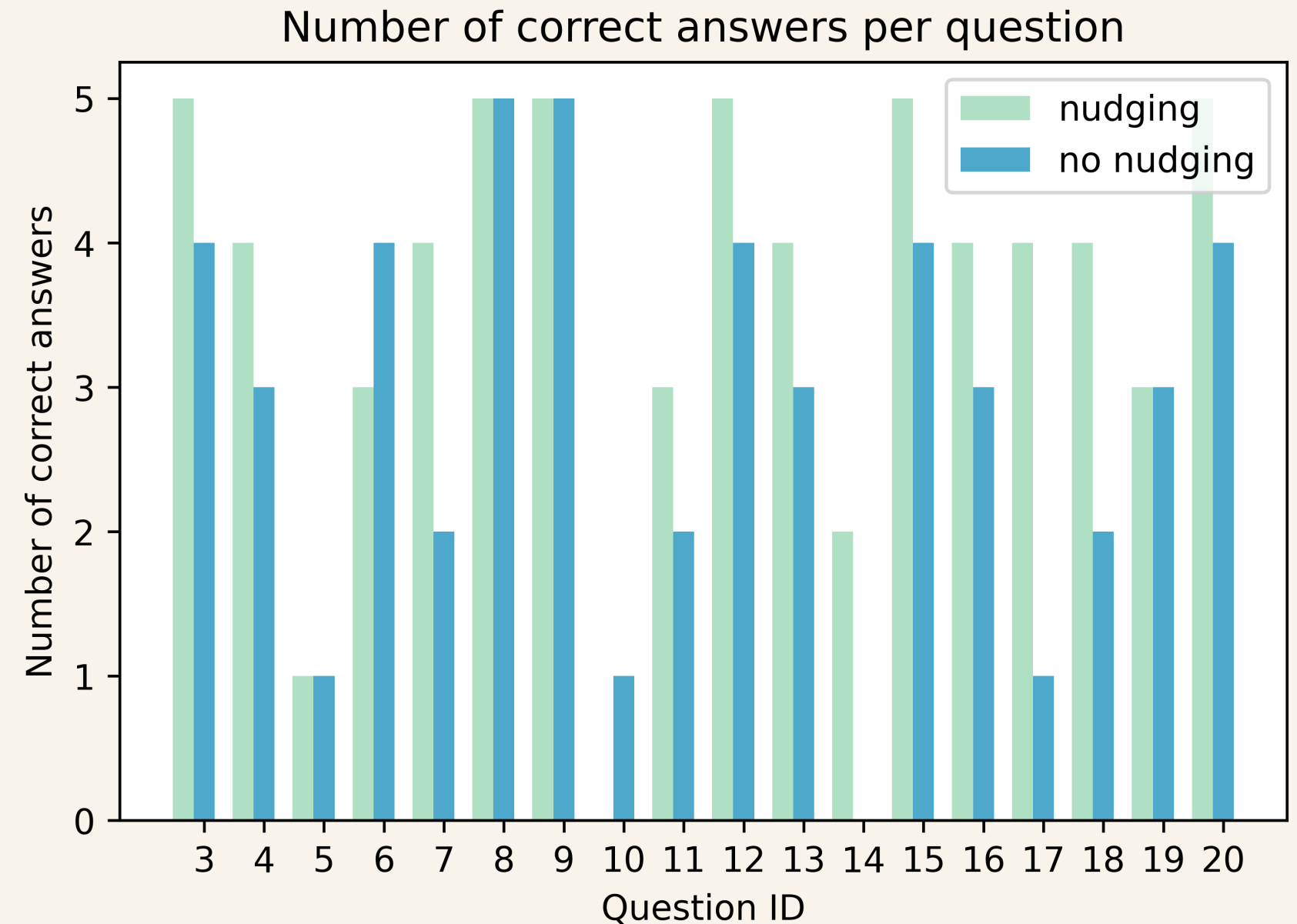
Your Team
Other Team

What number should follow in the series 33, 49.5, 74.25, 111.37, 167.06 ... ?

| 183.56 | 216.56 |
| 222.75 | 250.59 |

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Demographics

10 participants
16 to 24
No monetary compensation

Master
10%

Bachelor
30%

Secondary degree
60%

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Test Results - Correctness

Nudging: M=73% [95%CI 0.59-0.88]
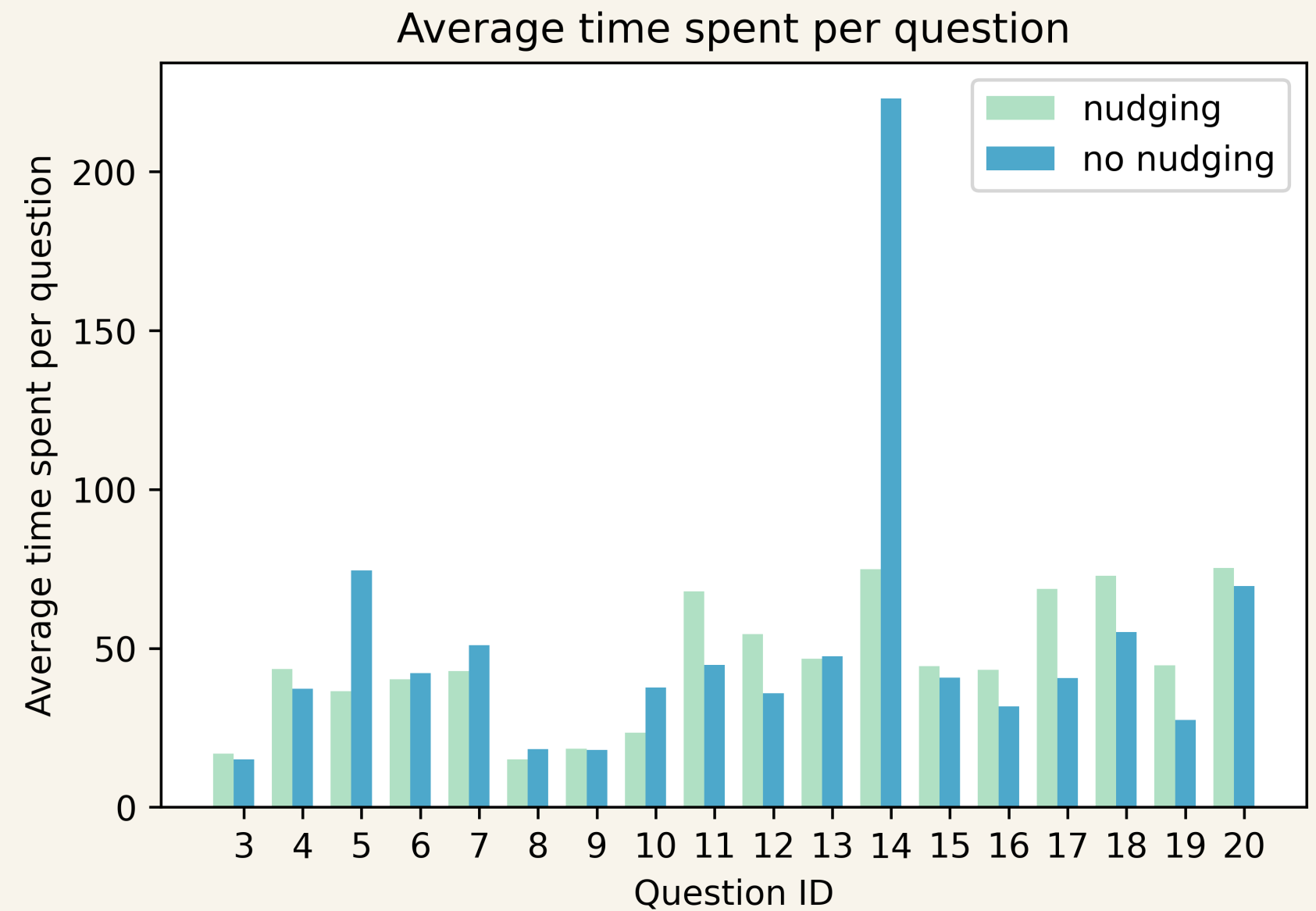Non Nudging: M=57% [95%CI 0.42-0.71]
p=0.963

Number of correct answers per question

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Test Results - Time

Nudging: M=46.11s
Non Nudging: M=50.57s
p>0.05

Average time spent per question

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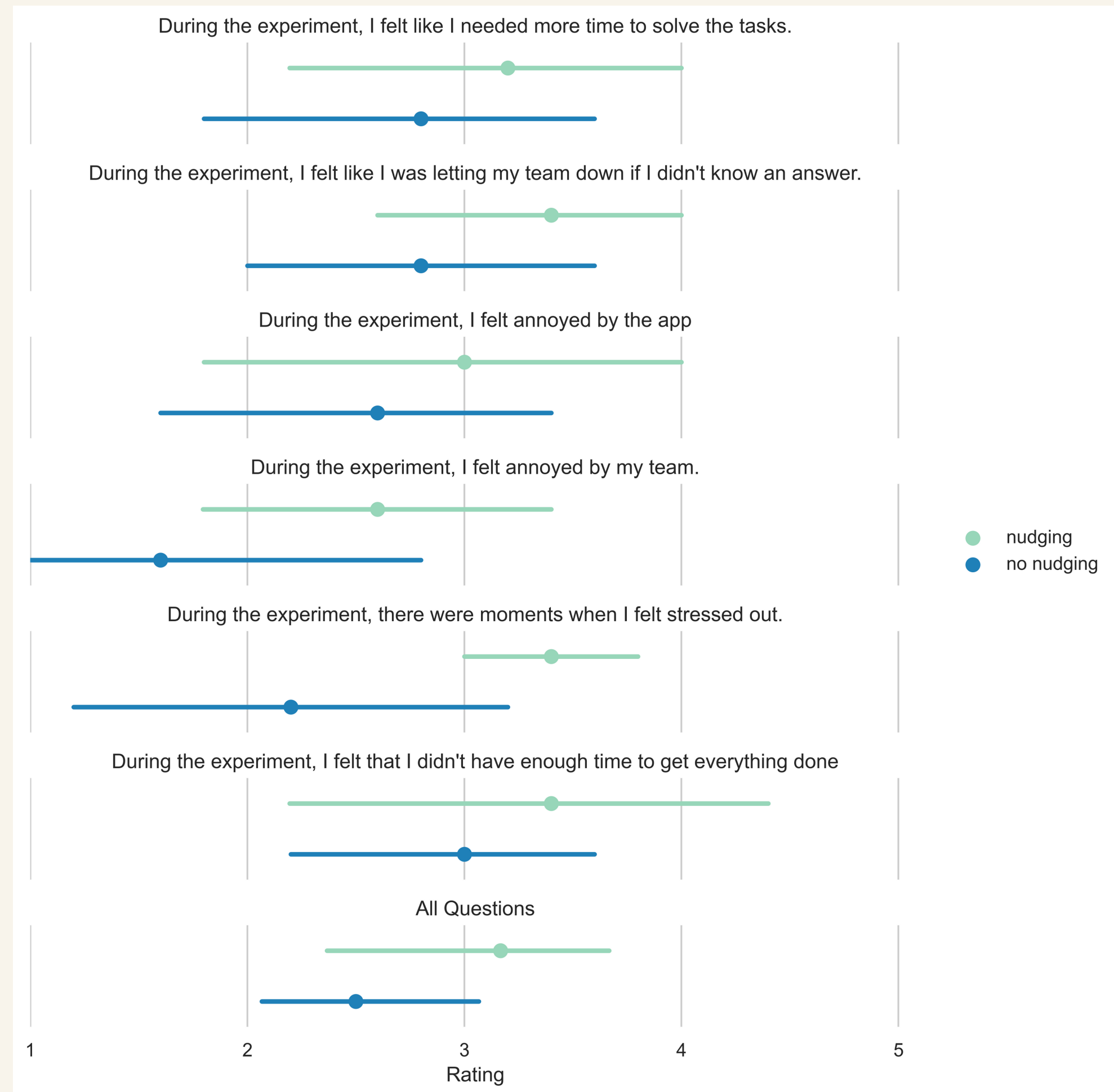
After the Test

- Survey: Increased stress ratings with nudging (p = 0.012)

- Interview: Participants reported stress increase through notifications

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Discussion

H1 - Increase in Stress

- Interview and Results hint at this being the case
- No sufficient statistical Significance

H2 - Decrease in Time

- Participants were quicker with notifications
- p>0.05, so no sufficient statistical significance

H3 - Decrease in Correctness

- Correctness actually increased with notifications
- p>0.05, so no sufficient statistical significance

Limitations

- Limited number of participants

- The study did not take into consideration the tiredness factor

- Some of the questions might have been harder for some people, based on their background

- Lack of actual social interaction

Future work

- Examine more participants

- Apply the study into real team-based situations

- More investigation into the topic

QUICK RECAP

RESEARCH QUESTION

Does gamification through nudging notifications increase anxiety and pressure on people in team-based situations?

FINDINGS

No significant effect ($n=10$); user interviews imply potential for future research

METHOD

A team-based multiplayer game where participants answer questions one after another. Two groups, one receiving notifications, one without.

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Thank You for Your Attention!