

# Effects of Workshop Group Gender Balance on Student Exam Performance

Update on replication studies:

2014-2018

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## Context

- Physics 1A class (introductory Newtonian mechanics)
- First-year, first-semester class
- Typical demographics:
  - ~ 270-310 students
  - ~ 75:25 male:female gender balance
  - ~ 50:50 majors:non-majors balance
- All non-majors possess Physics degree entry qualifications
- Taught in 'Flipped Classroom' format

## Teaching format

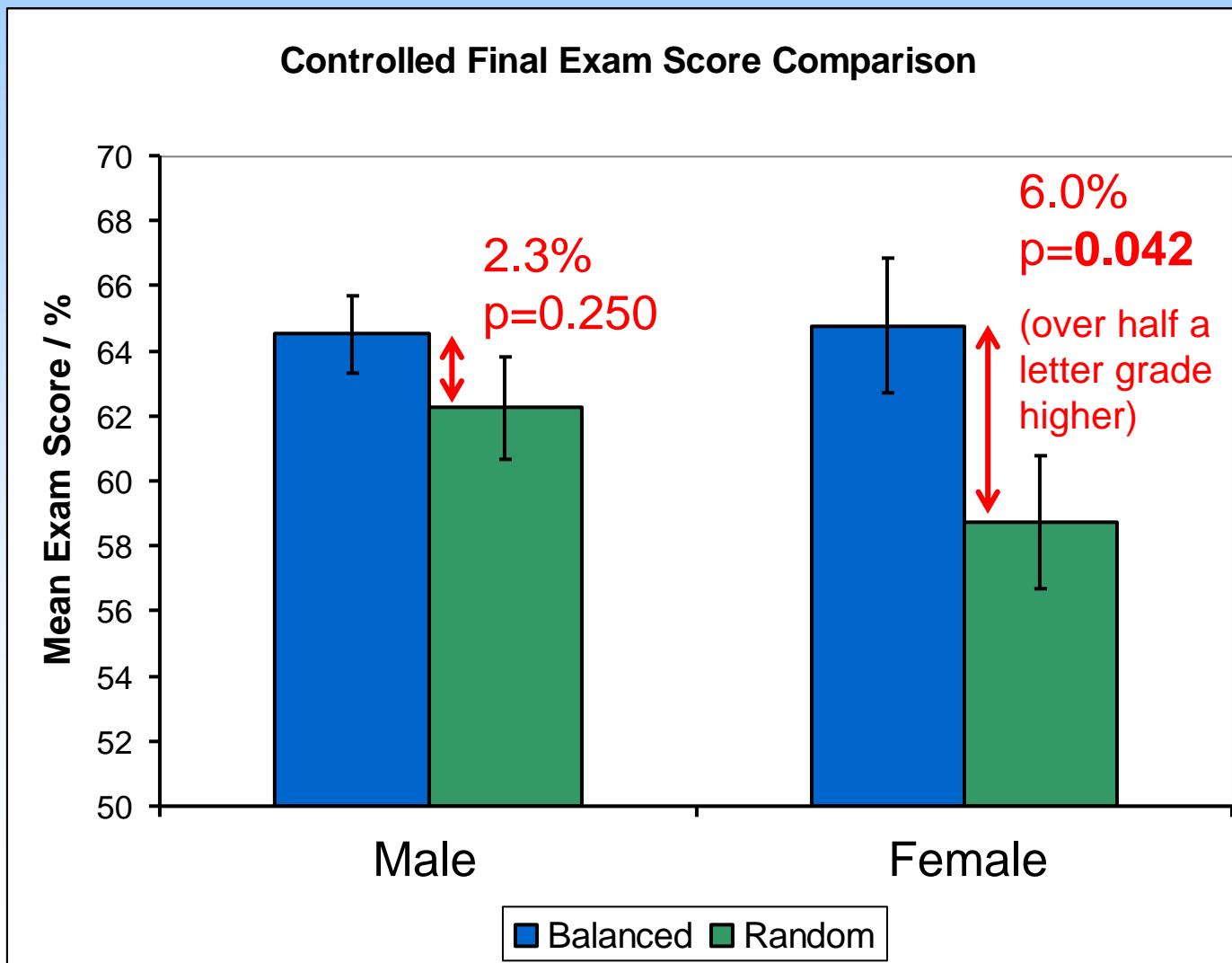
- 11-week semester. Each week:
  - 3 × 1-hour Peer Instruction based lecture
  - 1 × 3-hour workshop in teaching studio room
    - Workshops taught in 4 sections: Mon, Tue, Thu, Fri
    - Students randomly allocated to tables of 5 or 6
    - Demographics ⇒ typical group contains 1-2 females



## Intervention

- Monday and Thursday sections (**‘Balanced’**):
  - Where female students are present in group,  $\geq \frac{1}{2}$  of students must be female (typically 3 of 6)
  - Remainder of groups are all-male
  - Avoid drawing student attention to what we’re doing
- Tuesday and Friday sections (**‘Random’**):
  - Purely random allocation as before  $\Rightarrow$  ‘control population’
  - Typically 1 of 6 female students in each group
- No other interventions at all

## 2014-15 results



Balanced

Mon

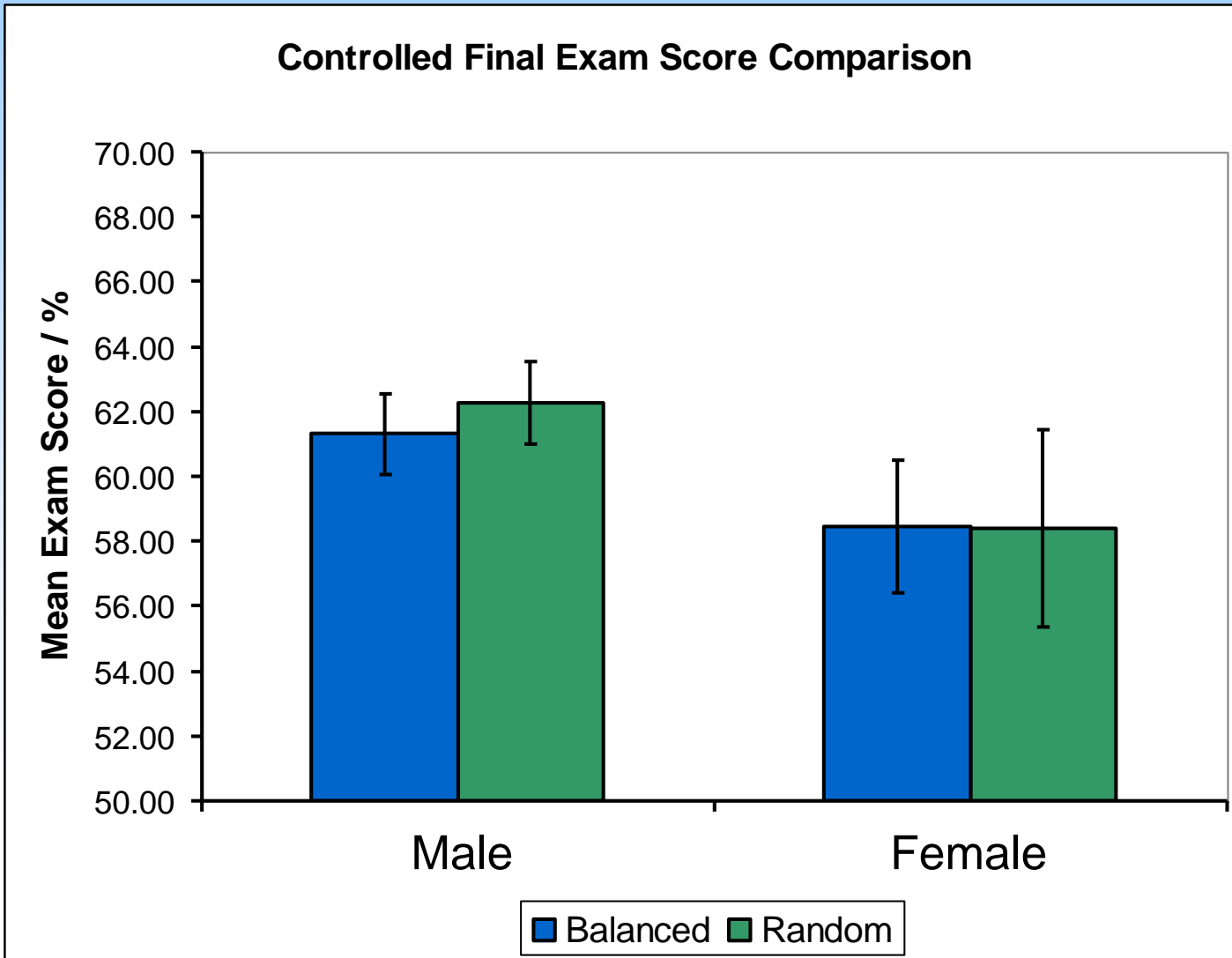
Thu

Random

Tue

Fri

## 2015-16 results



Balanced

Tue

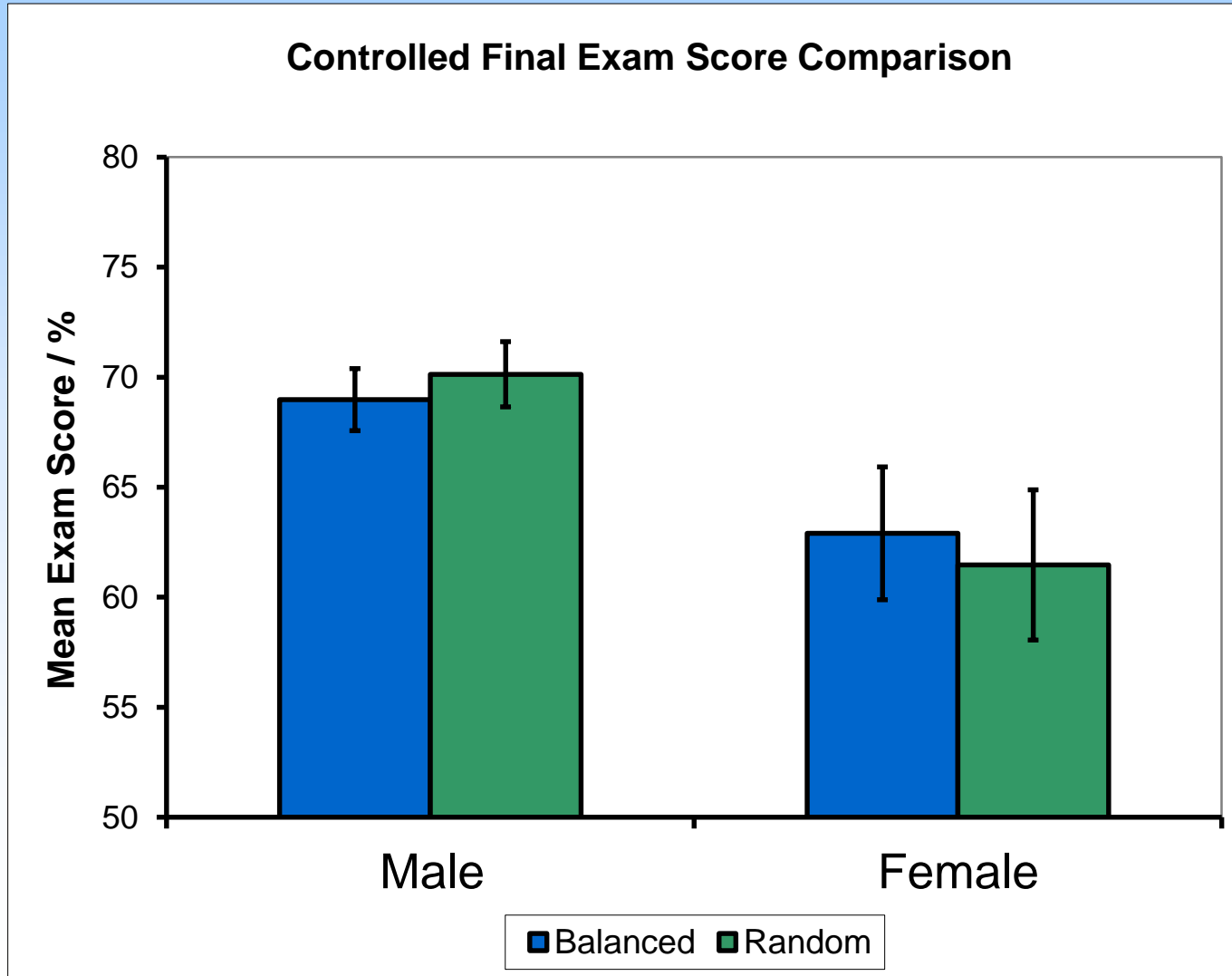
Fri

Random

Mon

Thu

## 2016-17 results



Balanced

Mon

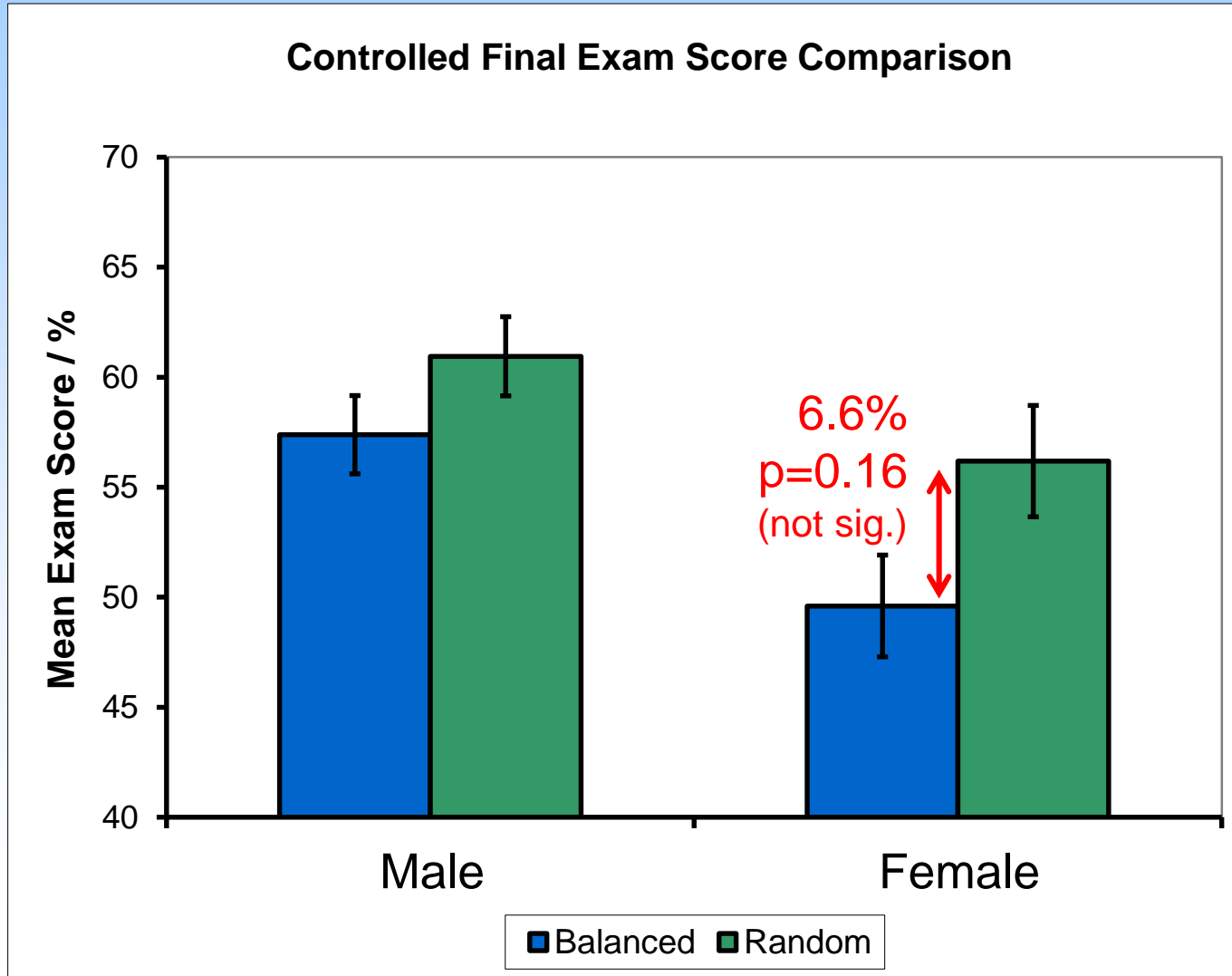
Fri

Random

Tue

Thu

## 2017-18 results



Balanced

Mon

Thu

Random

Tue

Fri



## Conclusions

- 2014-15 findings have not been replicated in three subsequent years.
- What's going on here?
  - Black swan event in 2014-15?
  - Hawthorne Effect?
- If there *is* a mechanism, it's very fragile.
  - And we don't understand it.
- **Highlights importance of replication studies.**

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