

# Unintended Consequences of Best Intentions: Evidence from Education



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## Introduction

Unequal resource distribution create powerful ripple effects throughout organizations, challenging our notions of fairness and equal opportunity.

Studies demonstrate that social interactions and resource allocation shape both professional growth and educational outcomes (Battu et al., 2003; Cornelissen et al., 2017).

This paper focuses on social interactions within the classroom, examining the spillover effects of a policy intervention in rural China.

## Social Network in Classroom

The Chinese education system provides a unique context for studying social networks in academic settings:

- students typically remain in assigned seating arrangements while teachers rotate between classrooms
- boarding students:** who live at the school during the weekdays and only return home on Friday, coming back to school on Sunday afternoon
- non-boarding students:** who return home daily after classes

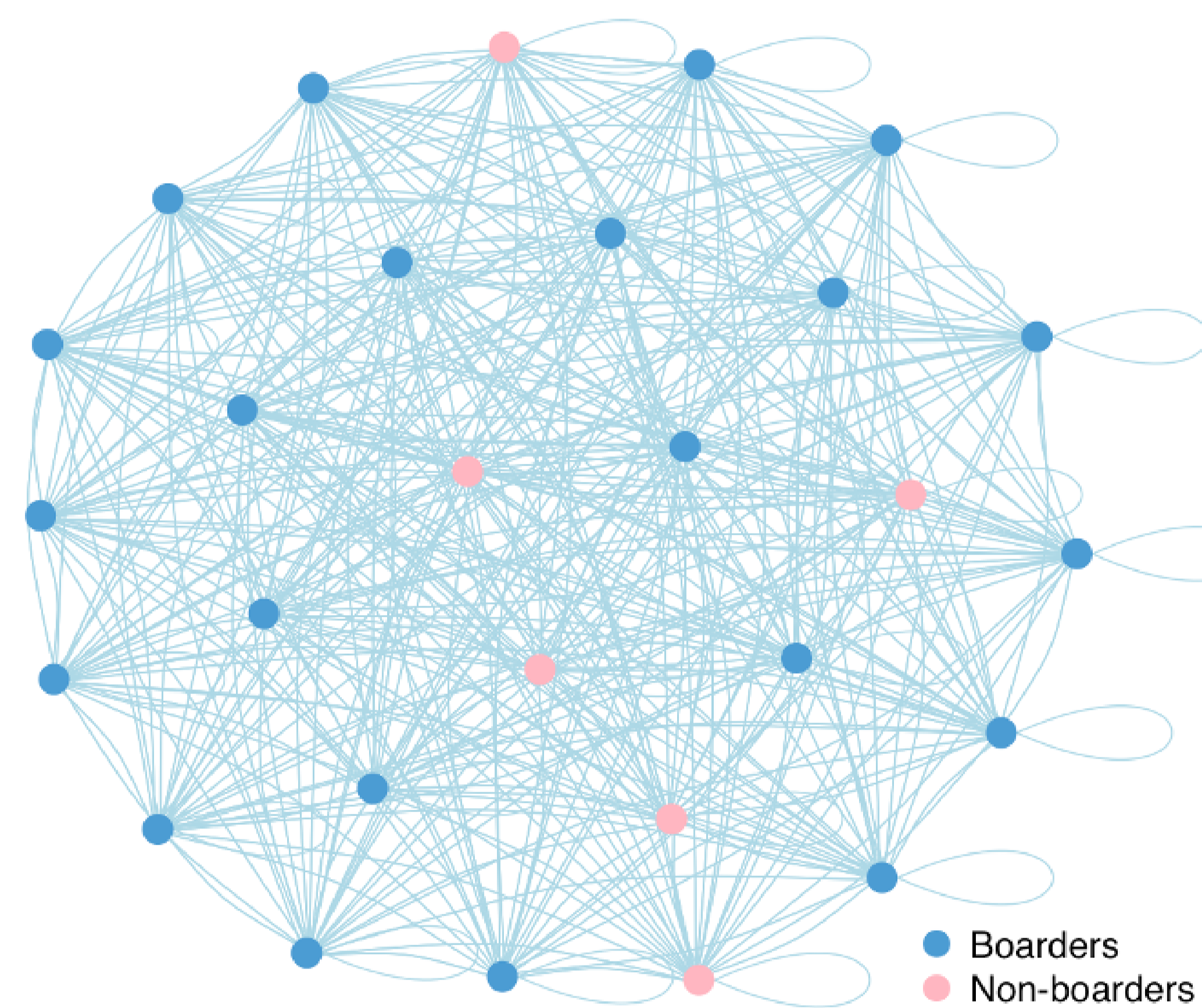


Figure 1. Social network map in a sample class

## Experimental Design

### Implementation:

- Baseline survey in October 2017; follow-up survey in June 2018
- Random allocation of **classes** to three treatment conditions

### Intervention: 40 minutes on Sunday afternoons.

- Only **boarding students in the treated class participated in the interventions**
- Computer-Assisted Learning (CAL): Classes use CAL software in a computer lab
- Traditional Workbooks: Classes use paper workbooks in the classroom
- Control Group: no intervention

## Spillover Effect Identification

Previous research by Ma et al. (2024) found that **both interventions improved boarding students' performance equally**. Our study extends this by exploring spillover effects on non-boarding students within treated class.

$$\begin{aligned} \text{Score}_{ic,\text{endline}} = & \beta_0 + \beta_1 \text{CAL}_{c,\text{baseline}} + \beta_2 \text{Workbook}_{c,\text{baseline}} \\ & + \beta_3 \text{Boardingnum}_{c,\text{baseline}} + \beta_4 \text{Classsize}_{c,\text{baseline}} + \beta_5 X_{ic,\text{baseline}} \\ & + \beta_6 \text{Score}_{ic,\text{baseline}} + \pi_s + \epsilon_{ic} \end{aligned} \quad (1)$$

**Sample:** 6,414 non-boarding students from 130 schools in 352 classes  
2,061 in CAL, 2,093 in workbook, and 2,260 in control

## Key Takeaways

- Equalizing educational resources through targeted programs may reduce aggregate welfare due to negative peer effects.
- The efficiency cost of promoting equality reveals a crucial tradeoff in education policy.
- Technology-based solutions can help balance equity goals with welfare maximization.

## Key Findings

### Workbook Negative Spillovers:

- 0.087 SD decline in non-boarding student performance
- Each 10% increase in workbook time led to 0.018 SD further decline

### Technology Solution:

- No negative spillovers from CAL sessions
- Physical separation minimizes psychological impact

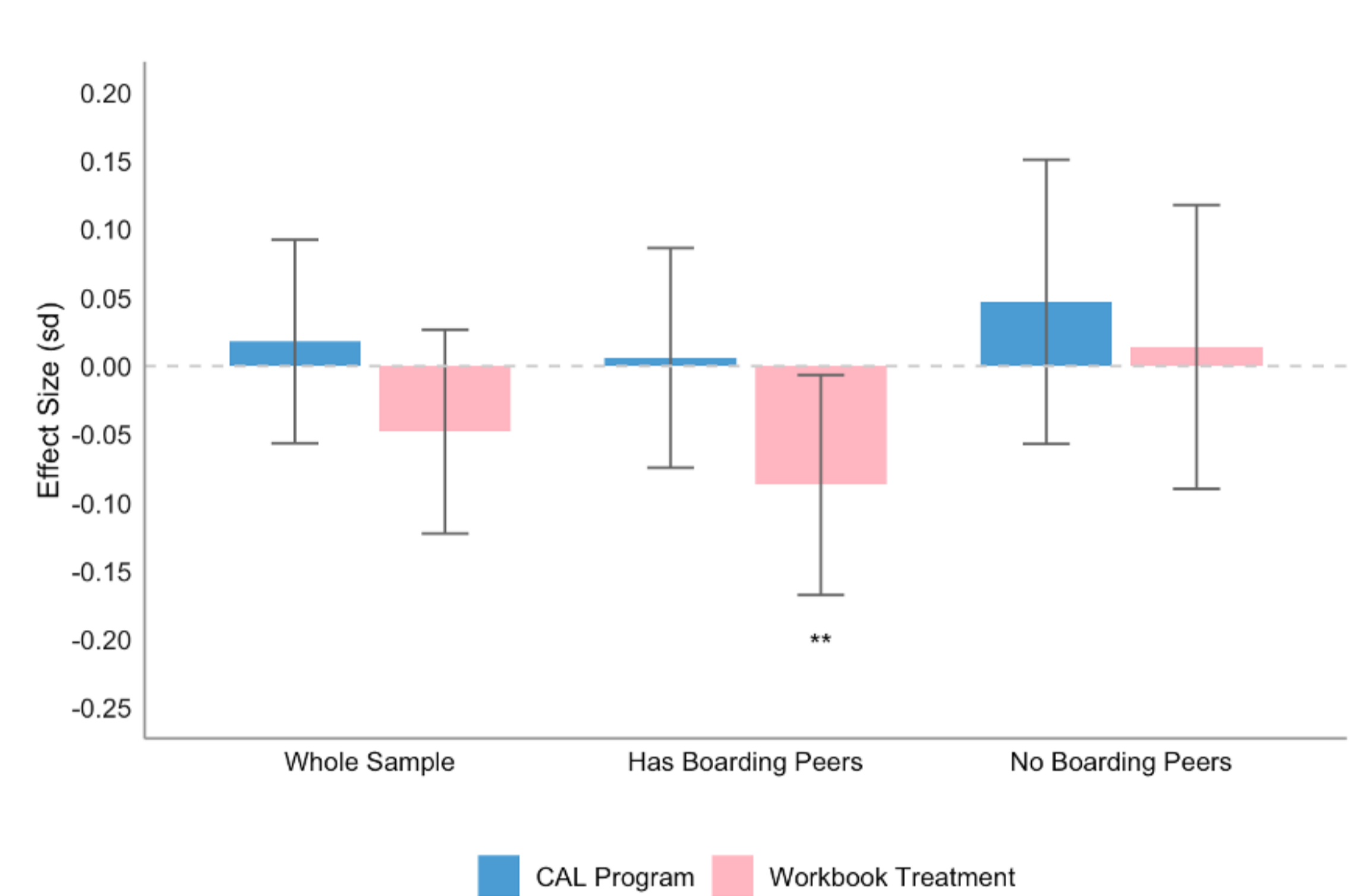


Figure 2. Treatment effect on academic performance

## Motivation Shift

- 0.051 point decrease in instrumental motivation
- Reduced belief in math's importance (-0.042 points)
- Decreased perception of math's relevance (-0.041 points)

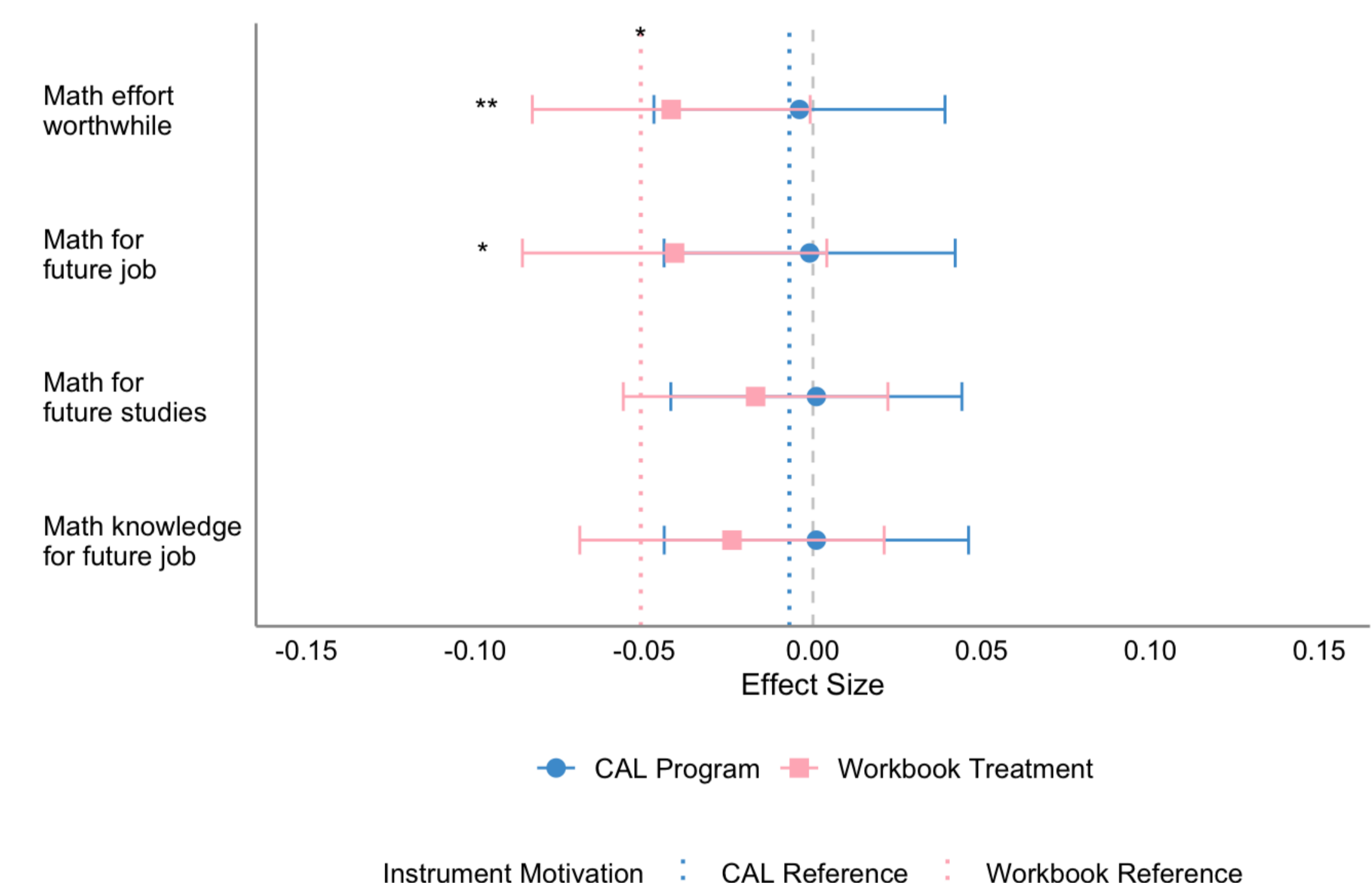


Figure 3. Treatment effect on instrumental motivation items

## Teacher Bias

- Non-boarding students with boarding peers ranked 1 position higher
- Those without boarding connections underestimated by 1.6 positions
- Increased perceived effort (6.8%) among non-boarding students without boarding peers

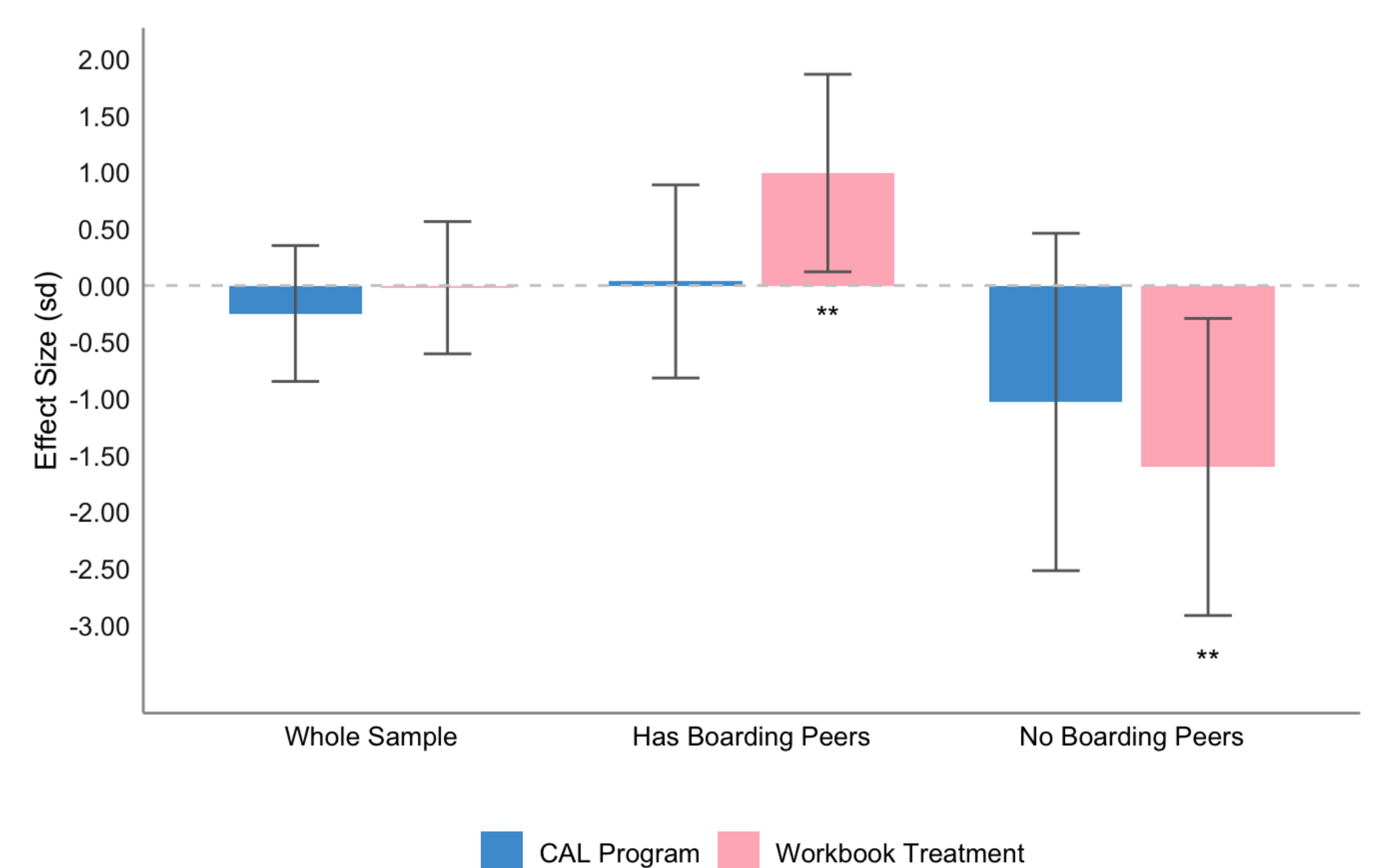


Figure 4. Treatment Effects on teacher evaluations