

Supplemental Appendix for

Is More Better? Evaluating Interventions to Increase Female Students' Interest in Economics

by Ann L. Owen, Evelyn Skoy, and Wei Zhan

Appendix A: Additional Results

A1: Descriptive Statistics of Sample

VARIABLES	N	mean	sd	Definition
Female	434	0.415	0.493	1 if student is female
MoreEcon	434	0.636	0.482	1 if student takes more econ
<i>Treatment Variables</i>				
OneTreatment	434	0.482	0.500	student had one treatment
TwoTreatments	434	0.217	0.412	student had two treatments
ThreeTreatments	434	0.0300	0.171	student had three treatments
Welcome	434	0.138	0.346	welcome email treatment
Study Group	434	0.558	0.497	study group treatment
Grade Email	434	0.249	0.433	end of semester grade email to median or above students
<i>Control Variables</i>				
Asian	434	0.0991	0.299	Asian American
International	434	0.0899	0.286	International Student
NotWhiteAsian	434	0.138	0.346	Black Hispanic or Multiracial
unknown	434	0.0161	0.126	Unknown race
White	434	0.657	0.475	White Student
Course Grade	434	3.202	0.590	Course grade on 4 point scale
Non-Econ Term GPA	434	3.503	0.420	Term GPA for courses other than intro econ
AP Calculus	434	0.862	0.346	If the student reports having taken AP Calculus
<i>Self Described Math Proficiency</i>				
Math1	434	0.0230	0.150	usually find graphs and equations difficult
Math2	434	0.240	0.427	sometimes struggle with graphs and equations
Math3	434	0.555	0.498	usually find graphs and equations easy
Math4	434	0.182	0.386	almost always find graphs and equations easy
<i>Previous Economics Experience</i>				
Experience1	434	0.578	0.494	No previous courses
Experience2	434	0.267	0.443	Some high school economics
Experience3	434	0.154	0.362	AP Economics
<i>Beginning of Semester Interest in Economics</i>				
Interest1	434	0.00461	0.0678	Not interested
Interest2	434	0.306	0.462	Somewhat interested
Interest3	434	0.429	0.495	Interested
Interest4	434	0.260	0.439	Very interested

Table A2--IMPACT ON LIKELIHOOD OF TAKING MORE ECONOMICS COURSES FOR MALE STUDENTS

	(1)	(2)	(3)	(4)
Indicator - exactly one treatment	-0.00236 [-0.198 0.208]	0.00654 [-0.175 0.234]		
Indicator - exactly two treatments	0.0425 [-0.174 0.485]	0.00806 [-0.155 0.225]	0.0386 [-0.403 0.410]	-0.00428 [-0.548 0.303]
Study Group			-0.00331 [-0.193 0.211]	0.00663 [-0.184 0.242]
End of Semester Email			0.00683 [-0.342 0.519]	0.00573 [-0.214 0.495]
Instructor FE	Yes	Yes	Yes	Yes
All Controls	No	Yes	No	Yes
Observations	254	254	254	254
Mean of Y	0.709	0.709	0.709	0.709

Notes: Wild bootstrap confidence intervals based on 1,000 replications in brackets.

Male students did not receive welcome email treatment.

Figure A1: Male Student Office Hour Visit Frequency

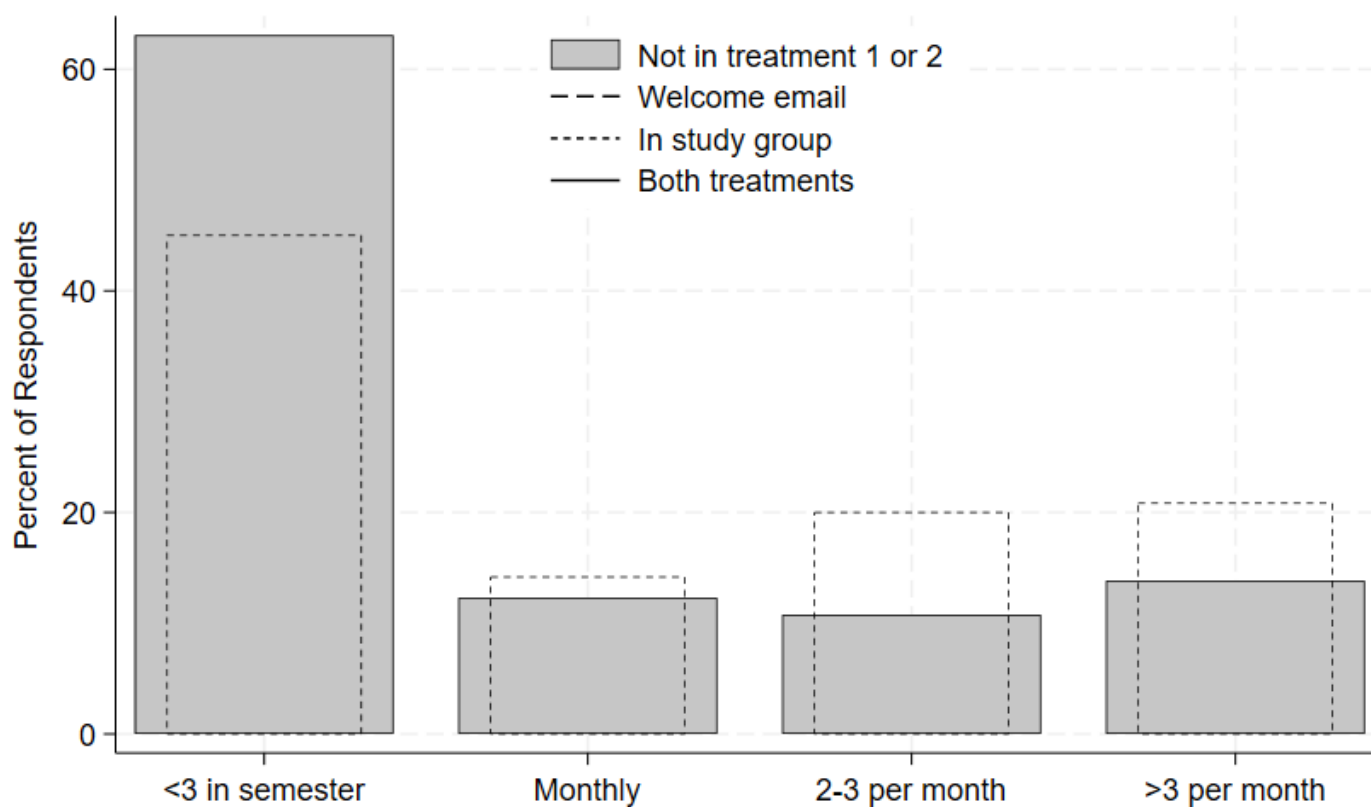


Figure A2: Self Reported Enjoyment of Study Group

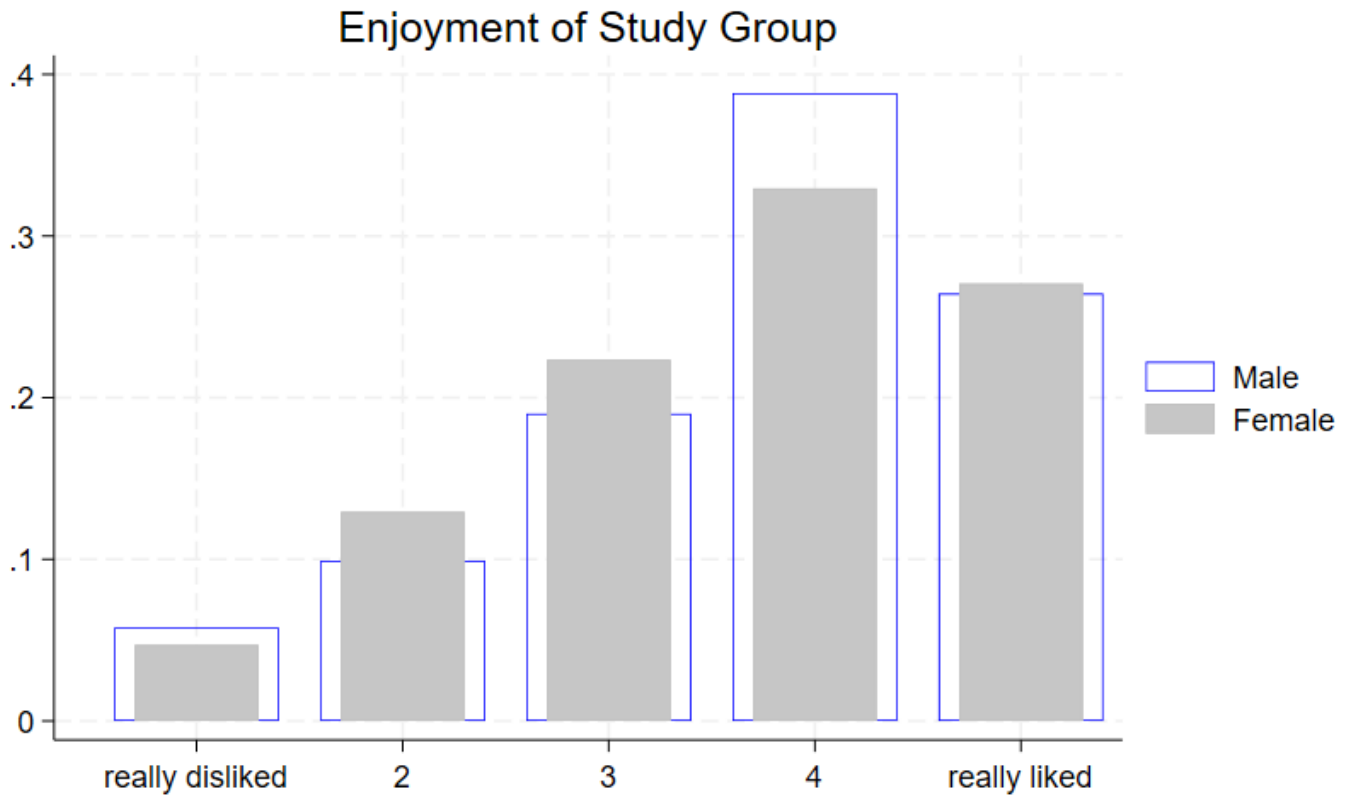


Figure A3: Self Reported Impact of Study Group on Meeting other Students

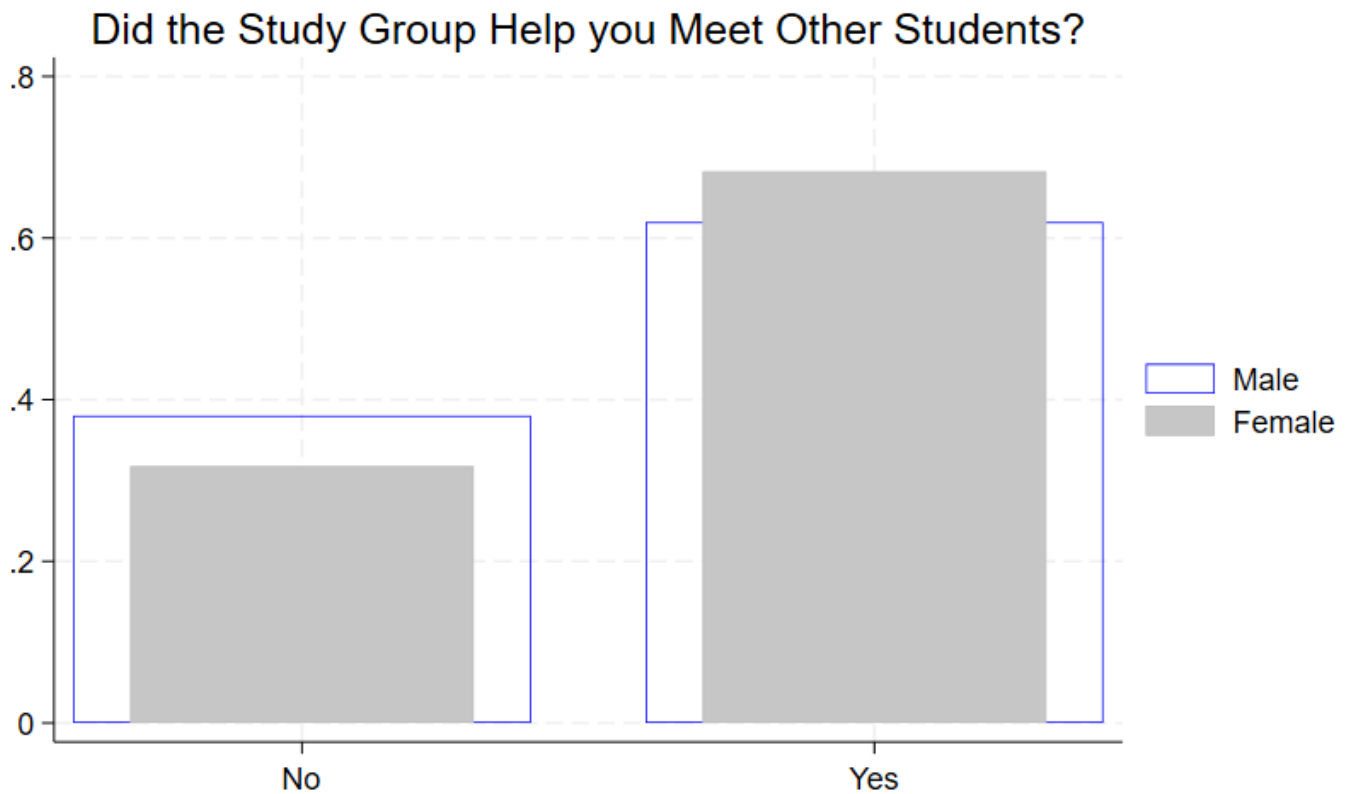
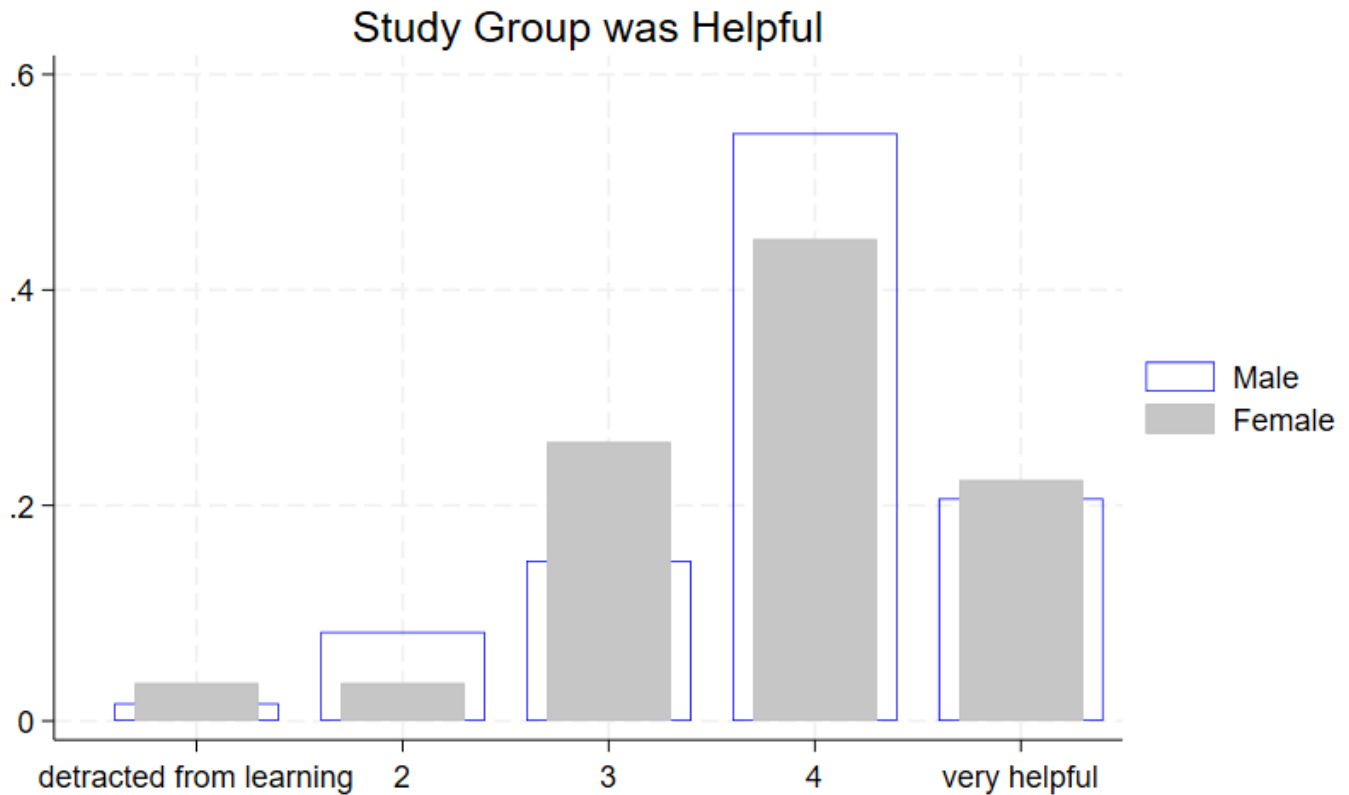


Figure A4: Self Reported Helpfulness of Study Group



Appendix B: Experiment Details

The experiment was registered with the AEA RCT registry. The public URL to the registry is: <https://www.socialscienceregistry.org/trials/16491>

This study was reviewed and approved by the Hamilton College Institutional Review Board (IRB ID#F22-007). All participants provided informed consent prior to participation.

Data Availability Statement: The data used in this study is proprietary and the authors do not have permission to share it publicly. Data and code has been made available to the AEA Data Editor for replication purposes.

Summary of the experiment: From Fall 2022 to Spring 2024, we conducted a two-year randomized controlled trial in 18 sections of Introduction to Economics taught by five instructors (three women and two men). Students, primarily first-years, were pre-assigned to course sections by the registrar based solely on scheduling constraints. We administered entry and exit surveys to all sections across all four semesters, and we obtained institutional records in Summer 2024 to track students' course performance and subsequent enrollment.

The experiment involved three light-touch interventions, each delivered independently and assigned at the section level:

1. Welcome email (female-only): A personalized, one-to-one message sent at the beginning of the semester to female students in treated sections, welcoming them to the course and encouraging them to attend office hours. (Example is below.)

2. Study groups: Weekly, peer tutor-facilitated study groups held in the evenings. Students in treated sections were randomly assigned to groups of four using stratified randomization to ensure that any group containing female students

included at least two women, to avoid isolation and foster a sense of belonging. Attendance in study groups counted for 2% of the course grade.

3. End-of-Semester Congratulations Email: A message sent to students (male or female) who scored above the section median, congratulating them on their performance and encouraging them to take additional economics courses. (Example is below.)

Across the 18 sections, 5 received no treatment, 7 received one treatment, 4 received two treatments, and 2 received all three. None of the treatments were always bundled together. This variation allows us to test each intervention individually and explore potential complementarities among them.

B1: Example welcome email

Dear [Student Name],

Now that the first couple of weeks of add/drops have passed, I wanted to send a more personal welcome to ECON 100! I'm looking forward to a terrific semester with you, and I wanted to reach out to remind you that I have open office hours Mondays from 2:00-3:00 PM and Wednesdays from 9:30 to 11:30 AM, but I would be happy to set up an individual appointment as well if desired. Please do not hesitate to reach out for extra help, to discuss topics that are of particular interest to you, or to learn more about what economists do!

See you in class,

[Instructor's Name]

B2: Example end-of-semester email

Hello!

Welcome back to campus! I enjoyed having you in my class last semester, and I wanted to congratulate you for earning a grade in the top half of the class. ECON XXX is a difficult course, and you should be proud of your performance!

I hope you had a wonderful break, and I hope to see you in another economics class or around XXX College soon.

Best,

[Instructor's Name]

B3: Beginning-of-Semester Survey Questions

The Economics Department is conducting a study to explore the impact of different teaching techniques on students' interest in studying economics. This study will use demographic and outcome information in the analysis. For the study, all data will be anonymized prior to analysis and no individually identifiable student information will be released, used or shared. Any results from the study reported to the broader College will be presented in the aggregate. Your participation in the study (or decision not to participate) will have no impact on your grade in the course. By completing this brief survey, you are consenting to having your data used in the study. If you do not consent or are under the age of 18, please do not complete the survey. If you have any questions about the study, please contact Professor Ann Owen (aowen@hamilton.edu).

Q1. What year are you in college?

- 1
 - 2
 - 3
 - 4
 - Other: Please explain
-

Q2. How would you describe your proficiency in math?

- I almost always find it very easy to work with equations and graphs
 - I usually find it easy to work with equations and graphs
 - I sometimes struggle when working with equations and graphs
 - I find it very difficult to work with equations and graphs
-

Q3. Did you take calculus in high school?

- Yes
 - No
-

Q4. How would you describe your familiarity with economics prior to this class?

- This is the first economics class that I have ever taken
 - I have taken some economics in high school
 - I took an AP-level or IB economics course in high school
-

Q5. How would you describe your interest level in economics?

- Not interested
 - Somewhat interested
 - Interested
 - Very interested
-

Q6. What was the most important reason you decided to enroll in an economics course?

- Very interested in the subject matter
 - It was recommended by a family member, friend, or advisor
 - It is necessary for your career goals/intended major
 - Know little about economics and curious to learn more
 - Other: _____
-

Q7. Are you considering majoring in economics?

- Yes, I am pretty certain I will major in economics
 - Yes, but I am also considering other options and am unsure
 - No, I am pretty certain I will not major in economics
 - I have no idea what I will major in
-

Q8. Please tell us your name

B4: End-of-semester Survey Questions

Q1. How would you describe your interest level in economics?

- Not interested
 - Somewhat interested
 - Interested
 - Very interested
-

Q2. Are you considering majoring in economics?

- Yes, I am pretty certain that I will major in economics
 - Yes, but I am also considering other options and am unsure
 - No, I am pretty certain that I will not major in economics
 - I have no idea what I will major in
-

Q3. How frequently did you go to the professor's or TA's office hours?

- Never
 - Occasionally (i.e., 1 to 2 times this semester so far)
 - About once per month
 - Two to three times per month
 - More than three times per month
-

Q4. Are you part of a study group?

- No
- Yes

Skip To: Q8 If Are you part of a study group? = No

Q5. How much did the study group help you learn the material for the class?

- It was very helpful
 - It was a little bit helpful
 - It was neither helpful nor unhelpful
 - It detracted a little bit from my learning
 - It detracted quite a bit from my learning
-

Q6. Did the study group help you get to know other students interested in economics?

- Yes
 - No
-

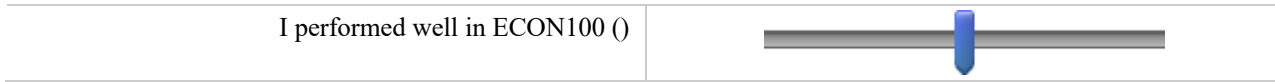
Q7 How much did you enjoy working in the study group?

- I really liked working in the group
 - I liked working in the group a little bit
 - I neither liked nor disliked working in the group
 - I disliked working in the group a little bit
 - I really disliked working in the group
-

Q8 On a scale from 0 (entirely disagree) to 100 (entirely agree), please indicate the extent to which you agree with the following statement: I performed well in ECON100.

Entirely Strongly Disagree Somewhat Neither Somewhat Agree Strongly Entirely
Disagree Disagree Disagree Disagree Agree Agree Agree
Nor
Agree

0 10 20 30 40 50 60 70 80 90 100



Q9 How do you think your performance in ECON100 compares to others in the class?

- It is significantly above average (1)
- It is a little above average (2)
- Average (3)
- It is a little below average (4)
- It is significantly below average (5)

Q10 Name (First and last please)
