Appendix

Appendix A. Supplemental Figures and Tables

Figure A.1: Sample Intervention Message: Information-Only Treatment

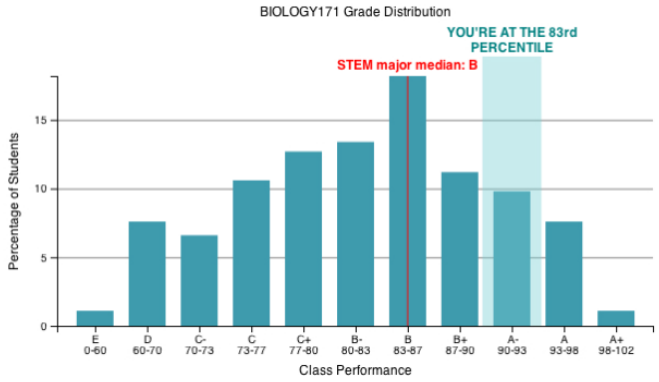
Your Bio 171 grade | And your major

[redacted],

A lot of people think they have to get *perfect* grades in the required classes to major in something. We're here to tell you: **it's not true**.

HERE'S HOW YOU'RE DOING.

This chart shows the distribution of scores for students in BIOLOGY 171 (as of November 11, 2019).



- Your score is 90.8.
- You're doing as well as or better than 83% of your classmates.

HERE'S HOW GRADES OFTEN LOOK.

The typical median grade for BIOLOGY 171 is:

- **B** for all students in BIOLOGY 171
- **B+** for BIOLOGY 171 students who declare a biology major
- **B** for BIOLOGY 171 students who declare a major in math, science, engineering, or economics

Surprised? We were, too, and we wanted to share the news with you.

In case you forgot, median means half the people are below it and half are above it.

AS YOU PLAN YOUR SCHEDULE...

A degree in biology — or another quantitative field like math, science, engineering, or economics — can open many doors.

If you want to learn more about these majors, consider scheduling an advising appointment:

- Biology
- LSA natural science major
- Computer Science
- Engineering
- Mathematics
- Economics

You can view course options for Winter 2020 here.

~ The ECoach Team

Figure A.2: Sample Intervention Message: Information-Plus-Encouragement Treatment

Your Bio 171 grade | And your major

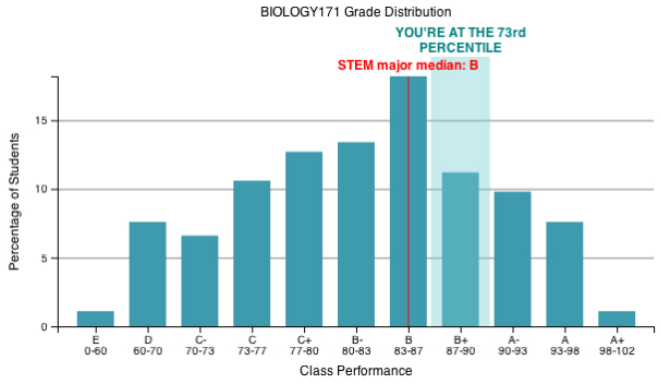
[redacted]

A lot of people think they have to get *perfect* grades in the required classes to major in something. We're here to tell you: **it's not true**.

In fact, **you're doing great** and we'd like YOU to **consider a major** in biology — or another quantitative field like math, science, engineering, or economics.

YOU'RE PERFORMING LIKE A STEM MAJOR!

This chart shows the distribution of scores for students in BIOLOGY 171 (as of November 11, 2019).



Congratulations! Your scores mean you're doing better than most students who go on to major in STEM.

- With your strong performance, your instructors hope you'll **consider a major** in biology, or another quantitative field like math, science, engineering, or economics.
- Your score is 87.9.
- You're doing as well as or better than 73% of your classmates.

HERE'S HOW GRADES OFTEN LOOK.

The typical median grade for BIOLOGY 171 is:

- **B** for all students in BIOLOGY 171
- **B+** for BIOLOGY 171 students who declare a biology major
- **B** for BIOLOGY 171 students who declare a major in math, science, engineering, or economics

Surprised? We were, too, and we wanted to share the news with you.

In case you forgot, median means half the people are below it and half are above it.

AS YOU PLAN YOUR SCHEDULE...

A degree in biology — or another quantitative field like math, science, engineering, or economics — can open many doors.

We hope you'll learn more about these majors. One way is to schedule an advising appointment:

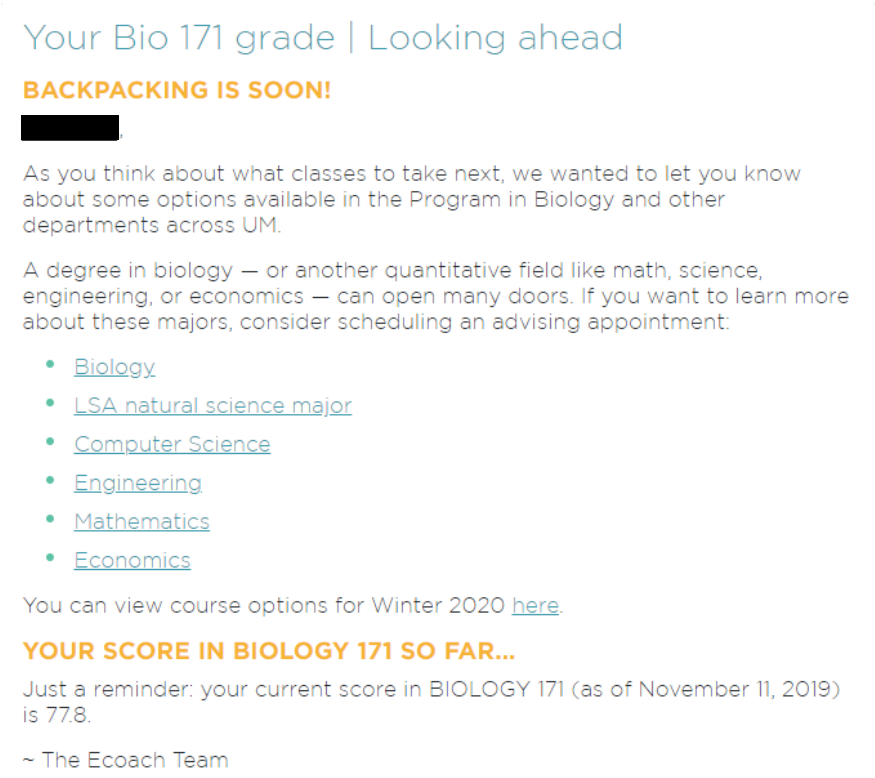
- Biology
- LSA natural science major
- Computer Science
- Engineering
- Mathematics
- Economics

You can view course options for Winter 2020 here.

Congrats again — keep up the good work!

~ The ECoach Team

Figure A.3: Sample Intervention Message: Control Group



Your Bio 171 grade | Looking ahead

BACKPACKING IS SOON!

[redacted]

As you think about what classes to take next, we wanted to let you know about some options available in the Program in Biology and other departments across UM.

A degree in biology — or another quantitative field like math, science, engineering, or economics — can open many doors. If you want to learn more about these majors, consider scheduling an advising appointment:

- Biology
- LSA natural science major
- Computer Science
- Engineering
- Mathematics
- Economics

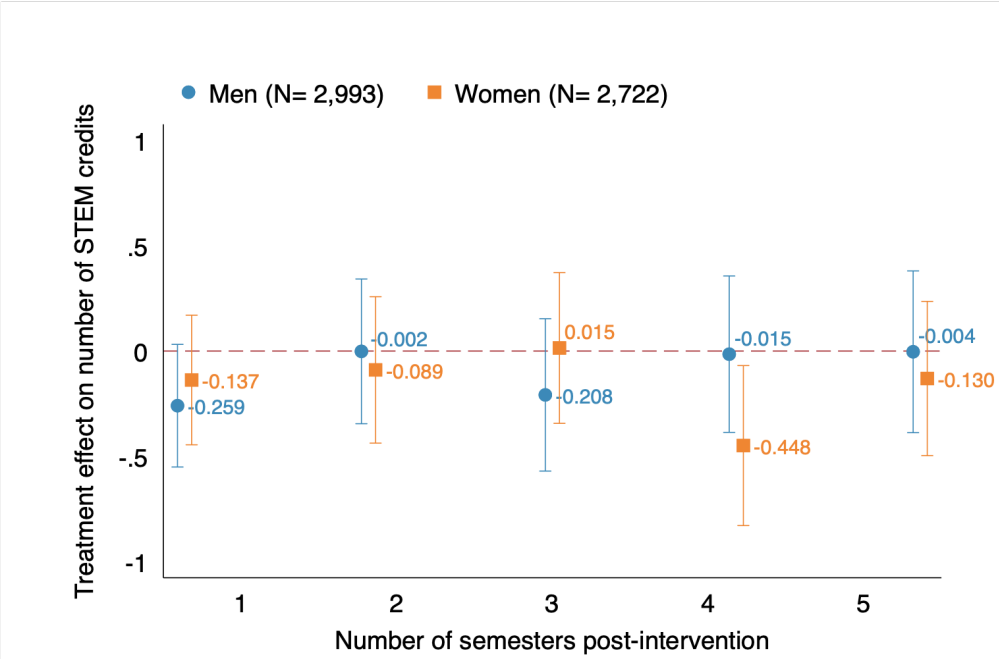
You can view course options for Winter 2020 here.

YOUR SCORE IN BIOLOGY 171 SO FAR...

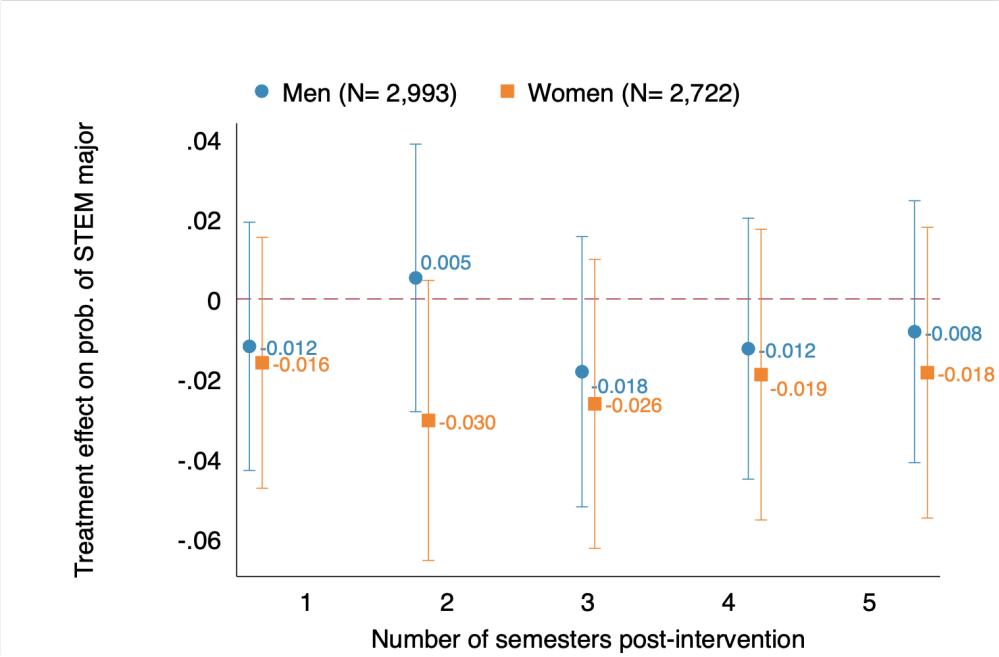
Just a reminder: your current score in BIOLOGY 171 (as of November 11, 2019) is 77.8.

~ The Ecoach Team

Figure A.4: Medium- and Long-Term Effects on Coursetaking and Major Choice, by Gender, Estimated without Covariates



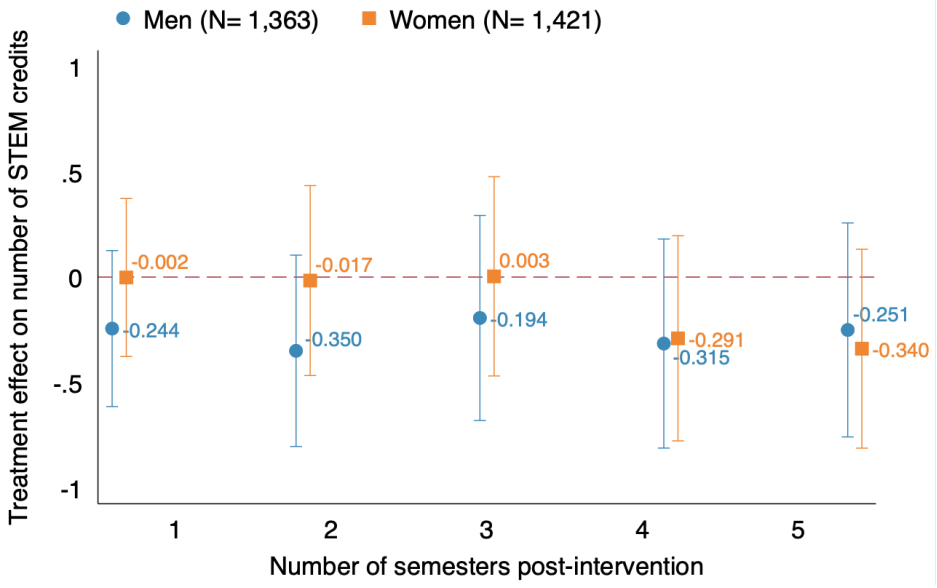
(a) Effects on Number of STEM Credits



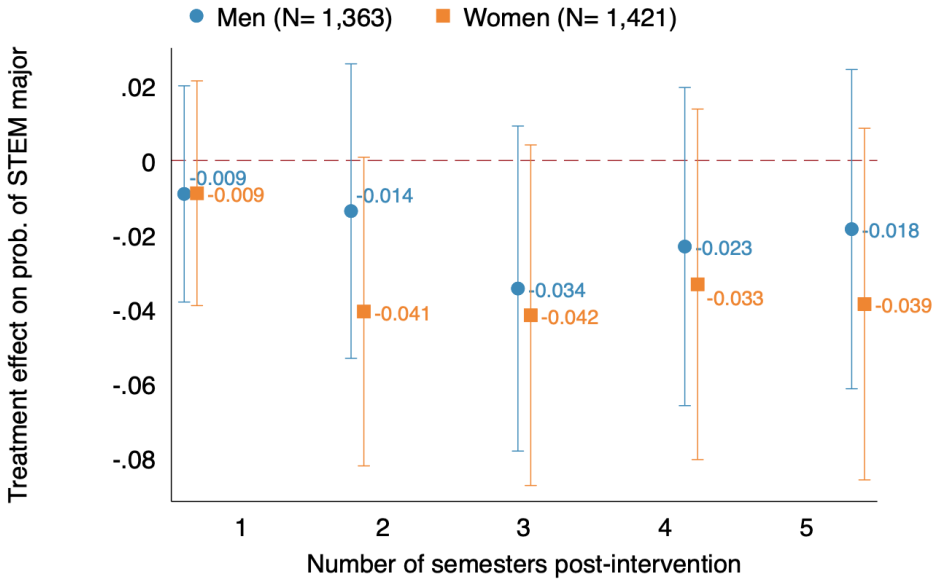
(b) Effects on Probability of Declaring a STEM Major

Notes: Treatment effects by gender estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling only for randomization strata dummies. Bars show 95% confidence intervals based on robust standard errors. Course-taking and major declaration outcomes based on University of Michigan administrative data. Number of credits are measured in a given semester (not cumulative). A student is coded as declaring a STEM major if they are declared as a STEM or econ major in the given semester or if they graduated with a degree in a STEM or econ field.

Figure A.5: Medium- and Long-Term Effects on Coursetaking and Major Choice, by Gender, Limited to Survey Respondents



(a) Effects on Number of STEM Credits



(b) Effects on Probability of Declaring a STEM Major

Notes: Sample limited to students with a response to the post-intervention survey. Treatment effects by gender estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling for student academic and demographic characteristics and randomization strata dummies. Bars show 95% confidence intervals based on robust standard errors. Course-taking and major declaration outcomes based on University of Michigan administrative data. Number of credits are measured in a given semester (not cumulative). A student is coded as declaring a STEM major if they are declared as a STEM or econ major in the given semester or if they graduated with a degree in a STEM
or econ field.

Table A.1: Intervention Message View Rate by Student Characteristics, Treated Students Only

Characteristic	Viewed message	Characteristic	Viewed message
Female	0.045**	*Declared major (omitted: other)*	
	(0.021)	Undeclared	-0.044**
Above course median	0.034*		(0.020)
	(0.020)	Engineering	-0.056*
Female*above median	0.008		(0.030)
	(0.026)	Math, science, or econ	-0.016
Course (omitted: Chemistry)			(0.028)
Biology	0.145***	*Acad. and demog. characteristics*	
	(0.027)	In state	-0.015
Econ (section 1)	0.108***		(0.015)
	(0.030)	Prior college GPA	0.081***
Econ (section 2)	0.116***		(0.025)
	(0.033)	College GPA missing	0.360***
Computer Science	0.162***		(0.090)
	(0.026)	Math placement score	0.002
Engineering	0.144***		(0.002)
	(0.031)	Placement score missing	0.046
Physics	0.129***		(0.058)
	(0.033)	ACT English	-0.005
Statistics	0.167***		(0.003)
	(0.024)	ACT math	0.003
Class standing (omitted: senior)			(0.003)
First year	0.034	ACT reading	-0.003
	(0.040)		(0.003)
Sophomore	0.039	ACT science	0.001
	(0.036)		(0.003)
Junior	0.017	ACT missing	-0.186*
	(0.037)		(0.106)
Race/ethnicity (omitted: other/multiple)		SAT math	-0.000
White	0.026		(0.000)
	(0.027)	SAT verbal	-0.000*
Hispanic	0.008		(0.000)
	(0.037)	SAT missing	-0.249**
Asian	0.016		(0.123)
	(0.029)	HS GPA	-0.009
Black	0.095**		(0.062)
	(0.046)	HS GPA missing	-0.016
Race/ethnicity missing	-0.039		(0.243)
	(0.050)	Took calculus in HS	0.008
			(0.020)
		HS calculus missing	-0.014
			(0.032)

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Table A.1 – *Continued from previous page*

Characteristic	Viewed message
Max parent ed (omitted: less than HS)	
High school	-0.045
	(0.050)
Some college	-0.048
	(0.052)
Bachelor's	-0.023
	(0.047)
Grad or professional degree	-0.049
	(0.046)
Parent ed missing	-0.061
	(0.077)
Family income (omitted: <$50,000)	
$50,000-100,000	-0.011
	(0.026)
Above $100,000	0.006
	(0.023)
Family income missing	0.003
	(0.025)
N	3,333

Notes: Table shows coefficients and robust standard errors from a regression where the dependent variable is an indicator for viewing the intervention message. Sample limited to students assigned to treatment.

Table A.2: Balance by Assignment to Information-Only and Information-Plus-Encouragement Treatment, Above-Median Students Only

	Control	Information only	Information plus encouragement	p-value
Female	0.461	0.459	0.461	-
Class standing (omitted: senior)				
First year	0.418	0.420	0.404	0.725
Sophomore	0.419	0.411	0.428	0.764
Junior	0.126	0.125	0.127	0.993
Race/ethnicity (omitted: American Indian or multiple race/ethnicities)				
White	0.566	0.527	0.555	0.180
Hispanic	0.041	0.055	0.044	0.305
Asian	0.319	0.343	0.330	0.493
Black	0.013	0.007	0.014	0.174
Declared major (omitted: other)				
Undeclared	0.545	0.541	0.539	0.964
Engineering	0.260	0.255	0.266	0.709
Math, science, or economics	0.104	0.112	0.091	0.306
Academic and demographic characteristics				
In-state	0.480	0.460	0.490	0.410
Prior college GPA	3.61	3.61	3.63	0.807
Math placement score (std)	0.330	0.365	0.331	0.540
ACT English	33.4	33.3	33.5	0.374
ACT Math	32.3	32.3	32.4	0.815
ACT Reading	32.7	32.3	32.7	0.057
ACT Science	32.2	32.1	32.2	0.896
SAT Math	738	739	735	0.306
SAT Verbal	661	659	661	0.902
High school GPA	3.92	3.92	3.91	0.629
Took calculus in HS	0.873	0.882	0.858	0.313
Max parental education (omitted: less than high school)				
High school	0.042	0.055	0.040	0.284
Some college	0.038	0.029	0.037	0.499
Bachelor's	0.242	0.221	0.248	0.366
Grad or professional degree	0.669	0.683	0.663	0.620
Family income (omitted: less than $50,000)				
$50,000-100,000	0.158	0.170	0.166	0.803
Above $100,000	0.731	0.704	0.716	0.502
Total N	940	943	940	2,823

Notes: Sample limited to above-median students; only above-median students were eligible for the information-plus-encouragement treatment. P-values based on a joint test of differences in the characteristic by treatment status, controlling for strata. I also test for differences in missingness rates on all variables and find none.

Table A.3: Balance by Assignment to Treatment, by Gender

	Men			Women		
	Control	Treat	p-value	Control	Treat	p-value
Class standing (omitted: senior)						
First year	0.446	0.407	0.078	0.419	0.428	0.688
Sophomore	0.370	0.405	0.236	0.406	0.401	0.711
Junior	0.135	0.136	0.813	0.129	0.128	0.934
Race/ethnicity (omitted: American Indian or multiple race/ethnicities)						
White	0.560	0.543	0.475	0.556	0.544	0.380
Hispanic	0.078	0.072	0.875	0.062	0.064	0.303
Asian	0.258	0.300	0.201	0.248	0.277	0.482
Black	0.025	0.018	0.672	0.052	0.033	0.212
Declared major (omitted: other)						
Undeclared	0.487	0.477	0.947	0.638	0.650	0.415
Engineering	0.305	0.314	0.842	0.153	0.149	0.384
Math, science, or economics	0.103	0.102	0.767	0.086	0.086	0.739
Academic and demographic characteristics						
In-state	0.514	0.506	0.688	0.534	0.536	0.366
Prior college GPA	3.30	3.37	0.812	3.44	3.48	0.365
Math placement score (std)	0.080	0.242	0.081	-0.251	-0.146	0.564
ACT English	32.4	32.5	0.287	32.2	32.7	0.397
ACT Math	31.9	32.1	0.641	29.8	30.4	0.663
ACT Reading	32.0	31.8	0.026	32.0	31.9	0.105
ACT Science	31.6	31.8	0.464	30.1	30.4	0.464
SAT Math	717	730	0.133	690	694	0.019
SAT Verbal	646	654	0.298	638	639	0.159
High school GPA	3.87	3.88	0.688	3.90	3.90	0.651
Took calculus in HS	0.832	0.867	0.097	0.796	0.806	0.653
Max parental education (omitted: less than high school)						
High school	0.069	0.062	0.998	0.072	0.079	0.125
Some college	0.052	0.043	0.591	0.077	0.061	0.534
Bachelor's	0.242	0.237	0.973	0.265	0.245	0.276
Grad or professional degree	0.612	0.639	0.647	0.561	0.593	0.785
Family income (omitted: less than $50,000)						
$50,000-100,000	0.175	0.185	0.307	0.190	0.195	0.462
Above $100,000	0.658	0.664	0.390	0.588	0.619	0.990
P-value on F-test of all X's		0.817			0.623	
Total N	1,240	1,753	2,993	1,142	1,580	2,722

Notes: "Treat" column includes students receiving either treatment arm. P-values based on a regression of the characteristic on treatment status, controlling for strata. I also test for differences in missingness rates on all variables and find none. F-test tests for joint significance of all listed characteristics as well as missingness rates in predicting treatment, controlling for strata.

Table A.4: Study Sample and Gender Breakdown by Course

Course (for study)	Number of students	Proportion of sample	Course proportion women
Biology	566	0.099	0.654
Chemistry	1,127	0.197	0.531
Economics	825	0.144	0.461
Computer Science	882	0.154	0.376
Engineering	453	0.079	0.305
Physics	327	0.057	0.269
Statistics	1,535	0.269	0.531
Total	5,715	1.000	0.476
In multiple courses	855	0.150	

Notes: Students in multiple courses are assigned to a single course, chosen randomly, for purposes of the study, so that the proportions across study courses sum to 1. Course proportion women measures the proportion of students in the sample for each course who are women.

Table A.5: Survey Response Rates

	Response rate	Number of responses
Pre-intervention survey		
Overall response	0.746	4,266
Item-level response		
Belief about own performance	0.641	3,664
Belief about STEM major performance	0.685	3,915
Post-intervention survey		
Overall response	0.487	2,784
Item-level response		
Belief about own performance	0.413	2,358
Belief about STEM major performance	0.461	2,632
Intended major	0.466	2,662
Grade stress	0.462	2,638
STEM interest index	0.462	2,639
General interest in STEM	0.460	2,631
Intent to seek STEM advising	0.461	2,632
Intent to take STEM courses	0.462	2,638
STEM success index	0.470	2,687
Grades good enough for STEM	0.465	2,655
Self-efficacy scale	0.464	2,651
STEM identity scale	0.461	2,636

Table A.6: Post-Intervention Survey Response by Student Characteristics, Full Sample

Characteristic	Took survey	Characteristic	Took survey
Female	0.071***	*Declared major (omitted: other)*	
	(0.017)	Undeclared	0.006
Above course median	0.070***		(0.019)
	(0.017)	Engineering	0.080***
Female*above median	-0.022		(0.025)
	(0.022)	Math, science, or econ	0.031
Course (omitted: Econ section 1)			(0.027)
Biology	0.561***	*Acad. and demog. characteristics*	
	(0.024)	In state	0.009
Chemistry	0.017		(0.012)
	(0.017)	Prior college GPA	0.109***
Computer Science	0.485***		(0.020)
	(0.022)	College GPA missing	0.418***
Engineering	0.642***		(0.071)
	(0.027)	Math placement score	0.002
Physics	0.086***		(0.002)
	(0.027)	Placement score missing	-0.007
Statistics	0.641***		(0.048)
	(0.017)	ACT English	0.001
Econ (section 2)	0.610***		(0.003)
	(0.028)	ACT math	-0.001
Class standing (omitted: senior)			(0.003)
First year	0.080**	ACT reading	0.000
	(0.035)		(0.003)
Sophomore	0.086***	ACT science	-0.005*
	(0.031)		(0.003)
Junior	0.023	ACT missing	-0.168*
	(0.031)		(0.093)
Race/ethnicity (omitted: other/multiple)		SAT math	-0.000
White	0.007		(0.000)
	(0.022)	SAT verbal	-0.000***
Hispanic	0.008		(0.000)
	(0.030)	SAT missing	-0.295***
Asian	0.067***		(0.104)
	(0.024)	HS GPA	0.123**
Black	-0.032		(0.053)
	(0.039)	HS GPA missing	0.479**
Race/ethnicity missing	0.052		(0.207)
	(0.039)	Took calculus in HS	-0.001
			(0.017)
		HS calculus missing	-0.016
			(0.026)

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Table A.6 – *Continued from previous page*

Characteristic	Took survey
Max parent ed (omitted: less than HS)	
High school	-0.000
	(0.044)
Some college	-0.024
	(0.046)
Bachelor's	0.011
	(0.041)
Grad or professional degree	-0.007
	(0.041)
Parent ed missing	0.027
	(0.064)
Family income (omitted: $<$ \$50,000)	
\$50,000-100,000	0.013
	(0.022)
Above \$100,000	0.026
	(0.020)
Family income missing	0.047**
	(0.022)
N	5,715

Notes: Table shows coefficients and robust standard errors from a regression where the dependent variable is an indicator for response to the end of term survey.

Table A.7: Balance by Assignment to Treatment, Post-Intervention Survey Respondents

	Control mean	Treatment mean	p-value	N non-missing
Female	0.517	0.506	-	2,784
Class standing (omitted: senior)				
First year	0.411	0.392	0.310	2,784
Sophomore	0.417	0.428	0.900	
Junior	0.129	0.136	0.340	
Race/ethnicity (omitted: American Indian or multiple race/ethnicities)				
White	0.533	0.535	0.916	2,698
Hispanic	0.061	0.063	0.194	
Asian	0.304	0.317	0.640	
Black	0.030	0.019	0.268	
Declared major (omitted: other)				
Undeclared	0.601	0.574	0.254	2,784
Engineering	0.201	0.209	0.300	
Math, science, or economics	0.095	0.104	0.502	
Academic and demographic characteristics				
In-state	0.506	0.517	0.291	2,784
Prior college GPA	3.44	3.47	0.204	1,172
Math placement score (std)	-0.025	0.107	0.869	2,676
ACT English	32.5	32.7	0.502	1,567
ACT Math	30.9	31.4	0.814	1,567
ACT Reading	32.1	31.9	0.008	1,567
ACT Science	30.9	31.1	0.367	1,567
SAT Math	708	717	0.251	1,623
SAT Verbal	640	647	0.815	1,623
High school GPA	3.89	3.90	0.999	2,374
Took calculus in HS	0.817	0.842	0.719	2,506
Max parental education (omitted: less than high school)				
High school	0.069	0.066	0.386	2,746
Some college	0.061	0.049	0.581	
Bachelor's	0.255	0.241	0.377	2,746
Grad or professional degree	0.593	0.624	0.636	
Family income (omitted: less than $50,000)				
$50,000-100,000	0.192	0.185	0.959	2,096
Above $100,000	0.628	0.659	0.919	
P-value on F-test of all X's		0.943		2,784
Total N	1,154	1,630	2,784	

Notes: Sample limited to students who responded to post-intervention survey. "Treatment" includes students receiving either treatment arm. P-values based on a regression of the characteristic on treatment status, controlling for strata. I also test for differences in missingness rates on all variables and find none. F-test tests for joint significance of all listed characteristics (except for female, which is blocked on) as well as missingness rates in predicting treatment, controlling for strata.

Table A.8: Estimated Effect of Intervention on Students' Beliefs about Themselves, Comparing Beliefs to End of Semester Performance

	Absolute value of error in percentile beliefs (| Predicted - realized |)			Signed error in percentile beliefs (Predicted - realized)		
	All	Men	Women	All	Men	Women
Treatment effect	-1.381**	-1.466	-1.298	0.329	0.086	0.567
	(0.651)	(0.987)	(0.861)	(0.929)	(1.382)	(1.250)
P-value, women vs. men			0.898			0.797
Control mean	19.351	20.241	18.469	4.952	7.2	2.722
N	2,355	1,166	1,189	2,355	1,166	1,189

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects for all students estimated from a regression of the outcome on assignment to either treatment, controlling for student academic and demographic characteristics and randomization strata dummies (Equation 1). Treatment effects by gender estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling for student academic and demographic characteristics and randomization strata dummies (Equation 2). Robust standard errors reported. All beliefs outcomes based on response to post-intervention survey. Realized performance measured at the end of the semester, as percentile rank of final grade.

Table A.9: Estimated Effect of Intervention on Students' Beliefs about Themselves and Other STEM Majors, Overall and by Gender, without Covariates

	Absolute value error in percentile beliefs (| Predicted - realized |)			Signed error in percentile beliefs (Predicted - realized)		
	All	Men	Women	All	Men	Women
Treatment effect	-1.509**	-2.415**	-0.626	0.543	0.414	0.669
	(0.658)	(1.006)	(0.851)	(0.845)	(1.264)	(1.126)
P-value, women vs. men			0.175			0.880
Control mean	18.981	20.331	17.646	6.361	8.471	4.276
N	2,358	1,166	1,192	2,358	1,166	1,192
	Underestimating course median for STEM majors			Overestimating course median for STEM majors		
	All	Men	Women	All	Men	Women
Treatment effect	-0.029**	-0.053**	-0.007	-0.025	0.009	-0.057**
	(0.015)	(0.022)	(0.019)	(0.018)	(0.026)	(0.026)
P-value, women vs. men			0.114			0.070
Control mean	0.206	0.257	0.159	0.46	0.368	0.545
N	2,632	1,291	1,341	2,632	1,291	1,341

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects for all students estimated from a regression of the outcome on assignment to either treatment, controlling only for randomization strata dummies. Treatment effects by gender estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling only for randomization strata dummies. Estimates with covariates are reported in Table 3. Robust standard errors reported. All beliefs outcomes based on response to post-intervention survey. Realized performance measured mid-semester, at the time of intervention.

Table A.10: Estimated Effect of Intervention on Students' Beliefs about Themselves and Other STEM Majors, Using Inverse Probability Weighting to Adjust for Survey Non-response

	Absolute value of error in percentile beliefs (|Predicted - realized|)			Signed error in percentile beliefs (Predicted - realized)		
	All	Men	Women	All	Men	Women
Treatment effect	-1.212	-2.871**	0.596	-0.192	-1.231	0.940
(inv. prob.-weighted)	(0.866)	(1.221)	(1.233)	(1.041)	(1.444)	(1.506)
P-value, women vs. men			0.048			0.300
Control mean (inv. prob.-weighted)	19.166	20.685	17.59	8.469	10.67	6.185
N	2,358	1,166	1,192	2,358	1,166	1,192
	Underestimating course median for STEM majors			Overestimating course median for STEM majors		
	All	Men	Women	All	Men	Women
Treatment effect	-0.019	-0.038	0.002	-0.012	0.017	-0.044
(inv. prob.-weighted)	(0.017)	(0.026)	(0.023)	(0.023)	(0.034)	(0.031)
P-value, women vs. men			0.243			0.187
Control mean (inv. prob.-weighted)	0.179	0.218	0.14	0.515	0.425	0.607
N	2,632	1,291	1,341	2,632	1,291	1,341

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Inverse probability weights (IPW) are constructed by running a logistic regression of an item response indicator on all of the characteristics listed in Table 1 as well as study course and an indicator for performing above the course median at the time of treatment. The IPW is equal to one over the predicted probability of response. IPW's are specific to individual survey items. Treatment effects for all students estimated from a regression of the outcome on assignment to either treatment, controlling for student academic and demographic characteristics and randomization strata dummies, weighting observations by the inverse of the predicted probability of responding to the relevant item. Treatment effects by gender estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling for student academic and demographic characteristics and randomization strata dummies and weighting by the IPW. Robust standard errors reported. All beliefs outcomes based on response to post-intervention survey. Realized performance measured mid-semester, at the time of intervention. Control means are also weighted by the IPW. Unweighted estimates are shown in Table 3.

Table A.11: Medium- and Long-Term Effects on Coursetaking and Major Choice by Gender

	Number of STEM credits one semester post		Number of STEM credits two semesters post		Number of STEM credits three semesters post		Number of STEM credits four semesters post		Number of STEM credits five semesters post	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Treatment effect	-0.276**	-0.079	0.029	-0.039	-0.184	0.044	0.025	-0.394**	0.024	-0.080
	(0.129)	(0.140)	(0.156)	(0.163)	(0.165)	(0.168)	(0.170)	(0.176)	(0.179)	(0.170)
P-value, women vs. men		0.303		0.763		0.334		0.086		0.674
Control mean	9.476	7.454	9.098	7.302	8.785	6.819	8.099	6.415	6.913	5.196
N	2,993	2,722	2,993	2,722	2,993	2,722	2,993	2,722	2,993	2,722
	Declared as STEM major one semester post		Declared as STEM major two semesters post		Declared as STEM major three semesters post		Declared as STEM major four semesters post		Declared as STEM major five semesters post	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Treatment effect	-0.013	-0.003	0.000	-0.022	-0.022	-0.020	-0.014	-0.014	-0.009	-0.014
	(0.009)	(0.010)	(0.013)	(0.014)	(0.015)	(0.016)	(0.015)	(0.017)	(0.015)	(0.017)
P-value, women vs. men		0.474		0.255		0.921		0.997		0.829
Control mean	0.451	0.285	0.54	0.377	0.623	0.459	0.694	0.515	0.695	0.518
N	2,993	2,722	2,993	2,722	2,993	2,722	2,993	2,722	2,993	2,722

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects by gender are estimated from a single regression of the outcome on assignment to either treatment, female, and treatment-times-female, controlling for student academic and demographic characteristics and randomization strata dummies (Equation 2). Robust standard errors are reported. Course-taking and major declaration outcomes are based on University of Michigan administrative data. Number of credits are measured in a given semester (not cumulative). A student is coded as declaring a STEM major if they are declared as a STEM or econ major in the given semester or if they graduated with a degree in a STEM or econ field.

Table A.12: Estimated Effect of Intervention on Students' STEM Course-taking by Gender and Treatment Arm, Above-Median Students Only

	Number of STEM credits one semester post intervention			Declared as STEM major five semesters post intervention		
	All	Men	Women	All	Men	Women
Pooled effect	-0.151	-0.285*	0.007	0.012	0.022	0.000
	(0.131)	(0.171)	(0.202)	(0.016)	(0.021)	(0.025)
P-value, women vs. men			0.271			0.505
Info-only effect	-0.192	-0.373*	0.021	0.011	0.028	-0.010
	(0.151)	(0.198)	(0.235)	(0.018)	(0.023)	(0.029)
P-value, women vs. men			0.201			0.309
Info + encouragement effect	-0.110	-0.197	-0.006	0.013	0.015	0.010
	(0.151)	(0.198)	(0.231)	(0.018)	(0.023)	(0.029)
P-value, women vs. men			0.530			0.884
P-value, info vs. info+enc	0.587	0.378	0.907	0.907	0.559	0.498
Control mean	9.527	10.512	8.373	0.69	0.748	0.624
N	2,823	1,524	1,299	2,823	1,524	1,299

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. All effects in this table are estimated on the sample of above-median students only. Only above-median students were eligible for the information-plus-encouragement treatment; all below-median treated students received information only. Effect of either treatment (pooled) for above-median students estimated from a regression of the outcome on an indicator for receiving either treatment (Equation 1). To estimate pooled effects separately for above-median men and women, an interaction between any treatment and female is added (Equation 2). Treatment effects of the information-only and info-plus-encouragement intervention for above-median students are estimated using the same specifications as above, but with two separate treatment indicators (Equation 3). All regressions control for student academic and demographic characteristics and randomization strata dummies. Robust standard errors reported. Course-taking and major choice outcomes based on University of Michigan administrative data.

Table A.13: Estimated Effect of Intervention by Student Level and Intended Major

	Number of STEM credits one semester post intervention	Declared as STEM major five semesters post intervention
A. Treatment effect by student level		
First year or sophomore	-0.211**	-0.012
	(0.099)	(0.012)
	[8.580]	[0.594]
Junior or senior	-0.051	-0.010
	(0.269)	(0.025)
	[8.174]	[0.686]
p-value, treat-by-level interaction	0.575	0.947
N	5,715	5,715
B. Treatment effect by pre-intervention intended major		
Intended STEM major	-0.248**	-0.023
	(0.123)	(0.015)
	[9.487]	[0.751]
Intended non-STEM major	-0.053	0.033
	(0.238)	(0.024)
	[4.809]	[0.142]
p-value, treat-by-major interaction	0.466	0.051
N	3,988	3,988

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects in Panel A estimated from a regression of the outcome on assignment to either treatment, an indicator for whether the student has junior or senior standing, and a treatment-by-level interaction, controlling for student academic and demographic characteristics and randomization strata dummies. Treatment effects in Panel B estimated from a regression of the outcome on assignment to either treatment, an indicator for intended STEM major, and a treatment-by-STEM-major interaction, controlling for student academic and demographic characteristics and randomization strata dummies. Intended major based on response to a question about planned major in the pre-intervention survey. Student level and course-taking and major choice outcomes based on University of Michigan administrative data. Robust standard errors reported. Control means in square brackets.

Table A.14: Estimated Effect of Intervention by Course Subject

	Number of STEM credits one semester post intervention	Declared as STEM major five semesters post intervention
Treatment effect by course subject		
Biology	0.326	0.059
	(0.305)	(0.041)
	[7.396]	[0.470]
Chemistry	-0.011	0.019
	(0.201)	(0.026)
	[9.534]	[0.609]
Computer Science	-0.431*	-0.068**
	(0.250)	(0.027)
	[8.835]	[0.689]
Economics	-0.165	-0.026
	(0.255)	(0.028)
	[7.007]	[0.471]
Engineering	0.335	0.031
	(0.267)	(0.033)
	[12.763]	[0.866]
Physics	-0.082	0.018
	(0.367)	(0.038)
	[12.221]	[0.860]
Statistics	-0.533***	-0.040*
	(0.197)	(0.023)
	[6.771]	[0.566]
P-value, F-test of treat-by-subject interactions	0.080	0.049
N	5,715	5,715

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects estimated from a regression of the outcome on assignment to either treatment, course subject, and treatment-by-subject interactions, controlling for student academic and demographic characteristics and randomization strata dummies. Robust standard errors reported. Course-taking and major choice outcomes based on University of Michigan administrative data.

Table A.15: Estimated Effect of Intervention by Instructor Gender

	Number of STEM credits one semester post intervention	Declared as STEM major five semesters post intervention
Treatment effect by instructor gender		
Male instructor	-0.195	-0.030*
	(0.153)	(0.017)
	[9.141]	[0.649]
Female instructor	-0.175	-0.001
	(0.121)	(0.015)
	[8.137]	[0.588]
p-value, treat-by-female-instructor interaction	0.916	0.190
N	5,715	5,715

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects estimated from a regression of the outcome on assignment to either treatment, an indicator for whether the course instructor was female, and a treatment-by-female-instructor interaction, controlling for student academic and demographic characteristics and randomization strata dummies. Instructor gender collected from university and personal webpages, based on (in order of priority) stated pronouns, pronouns used on webpage, photo, and name. Two courses (economics and physics) have only male instructors and three (biology, chemistry, and statistics) have only female instructors. Two courses (engineering and computer science) have both male and female instructors, depending on section. Course-taking and major choice outcomes based on University of Michigan administrative data. Robust standard errors reported. Control means in square brackets.

Table A.16: Estimated Effect of Intervention by Gender Composition of Course (Proportion Men, Continuous)

	Number of STEM credits one semester post intervention	Declared as STEM major five semesters post intervention
Treatment effect (main)	-0.129 (0.470)	0.043 (0.058)
Proportion male (main)	0.499 (2.973)	1.259*** (0.348)
Treatment-by-proportion-male interaction	-0.102 (0.866)	-0.104 (0.104)
N	5,715	5,715

Notes: $*p < 0.1$; $**p < 0.05$; $***p < 0.01$. Treatment effects estimated from a regression of the outcome on assignment to either treatment, a continuous measure of the proportion of the course sample that is male (0-1), and a treatment-by-proportion-male interaction, controlling for student academic and demographic characteristics and randomization strata dummies. Robust standard errors reported. Course-taking and major choice outcomes based on University of Michigan administrative data.