Science Advances
AAAS

advances.sciencemag.org/cgi/content/full/7/18/eabe0985/DC1

Supplementary Materials for

Inside the STEM pipeline: Changes in students' biomedical career plans across the college years

Emily Q. Rosenzweig*, Cameron A. Hecht, Stacy J. Priniski, Elizabeth A. Canning, Michael W. Asher, Yoi Tibbetts, Janet S. Hyde, Judith M. Harackiewicz

*Corresponding author. Email: Emily.rosenzweig@uga.edu

Published 30 April 2021, *Sci. Adv.* **7**, eabe0985 (2021)
DOI: 10.1126/sciadv.abe0985

The PDF file includes:

Other Supplementary Material for this manuscript includes the following:

(available at advances.sciencemag.org/cgi/content/full/7/18/eabe0985/DC1)

Supplementary Text

Additional Methodological Information

A previous study (*13*) reports details about the sample included in this research project as it compares to the samples of the original research projects from which the population for this study was drawn. Table S1 reports a list of the relevant questions students completed during their interviews (see *13* for complete list of questions).

Additional Information Regarding Analyses Reported in Manuscript

Attrition analyses. Table S2 reports the "traditional" pipeline analysis for the sample, in terms of the number of students retained at each of two points along the biomedical pipeline. It also breaks these groups into demographic categories, demonstrating the significant effect of URM status on students' likelihood of completing degrees in biomedical fields.

Whether or not career plans changed. Table S3 reports whether or not students changed their career plans at any point between when they took the introductory biology course and when they graduated with biomedical career plans, showing the significant effect of gender on likelihood of changing plans.

Type of career plan change as a function of gender and ethnicity. Table S4 reports the type of career plan change students made with respect to future years of education (no change to future plans, change to a career requiring the same amount of post-graduate education, change to a career requiring more years of education, change to a career requiring fewer years of education) as a function of gender and ethnicity. This table shows the significant effect of gender on type of career plan change, in addition to the significant proportion differences in follow-up tests suggesting that women more often went down in their educational aspirations compared to men.

Type of career plan change as a function of disenchantment versus attraction. Table S5 reports the type of career plan change students made as a function of whether or not students who changed career plans reported that their change was due to attraction versus disenchantment. This table shows the significant effect of disenchantment versus attraction on type of change, in addition to the significant proportion differences in follow-up tests between disenchantment and attraction for those who changed plans to a career requiring the same amount of education and those who changed plans to a career requiring fewer years of education.

Disenchantment versus attraction as a function of gender and ethnicity. Table S6 reports whether or not students changed career plans due to disenchantment versus attraction as a function of gender and ethnicity, showing no significant overall differences in either analysis.

Educational aspirations at baseline and interview time points. Table S7 reports the breakdown of students' educational aspirations among the 921 students who pursued degrees in biomedical fields. This table reports separately the aspirations among students who did change their career plans and those who did not. For students who did change their career plans, we report students' baseline and final career educational aspirations. For students who did not change their career plans we report only final career aspirations, because students indicated that they had the same aspirations throughout the course of the study.

Educational aspirations at baseline and interview time points by gender. Table S8 reports the same information as Table S7 does, but breaks down results separately for males and females. This table provides the information used to compute the percentage of males and females who pursued doctoral or higher career aspirations at the beginning and end of the study, by collapsing together the students pursuing doctoral degrees between those who changed plans

and did not change plans, using the students' data from baseline or final, respectively, among those who changed plans for the two analyses. Results show that at baseline, among the 921 students who remained in the pipeline, 72.5% of women and 78.9% of men had reported doctoral level career plans; however, at graduation, across all baseline plans, only 56.3% of women had doctoral level plans, compare to 70.5% of men, ($\chi^2(1) = 4.68$, $p = .03$ and 18.30, $p < .001$, respectively). Breaking this down in terms of percentages of each group who *began* with doctoral aspirations at baseline, 74.0.% of women who had doctoral plans at baseline continued to pursue doctoral plans at graduation compared to 86.3% of men, and this gender difference was significant ($\chi^2(1)=14.87$, $p < .001$). This is the finding that was reported in the text.

Educational aspirations at baseline and interview time points by ethnicity. Table S9 reports the same information as Table S9 does but breaks down results separately for URM and majority students. We conducted the same type of analysis as noted in the previous paragraph using this table. Results showed that the differences among URM students were not the same as the differences by gender: At baseline 81.6% of URM students and 73.9% of majority students had doctoral-level career plans, whereas at graduation, across all baseline plans, 67.2% of URM students and 60.7% of majority students had doctoral level plans ($\chi^2(1) = 3.41$, $p = .06$, and 1.93, $p = .17$, respectively). Breaking this down in terms of percentages of each group who *began* with doctoral aspirations at baseline, 78.4.% of URM students who had doctoral plans at baseline continued to pursue doctoral plans at graduation compared to 78.9% of majority students, and this difference was not significant ($\chi^2(1)= 0.01$, $p = .90$). This is the finding that was reported in the text.

Maintaining doctoral-level career aspirations at baseline and interview time points by gender and ethnicity. It is important to consider the intersection of gender and race/ethnicity. Table S10 shows the number and percentage of students who maintained doctoral-level or higher career aspirations from baseline through the interview time point, broken down for intersectional exploration by gender and ethnicity. Although our sample is underpowered to analyze gender-ethnic interactions statistically, the trends in these tables can provide preliminary information about whether the differences in doctoral-level career pursuit by gender also are similar across ethnic groups. As can be seen in the table, there was a difference in the percentage of students maintaining doctoral-level career pursuits through graduation between males and females in both ethnic groups, however, the difference was larger for majority group individuals than for URM individuals.

Case study analysis of aspirations declining from pre-medical-school career aspirations. Table S11 reports the career paths pursued by students in the pipeline who began intending to pursue medical school but declined in their educational aspirations by the follow-up time point. This finding was discussed in the case-study analysis section of the manuscript. Results demonstrate the breakdown of career paths by gender among those who began the study with medical school aspirations but ultimately lowered their future career-related educational aspirations. Because of the small frequencies of some careers occurring we only conducted chi-square frequency tests to determine the significance of the top four careers represented in the table; results illustrate that there were significant gender differences in the rate of pursuing all four careers as are discussed in the text.

Comparing reasons for changed plans within the pipeline to reasons for leaving the pipeline. A previous study (*13*) examined attrition from the biomedical pipeline at an earlier time point and also classified students' reasons for changing plans away from biomedical fields in terms of attraction, disenchantment, or both. One-hundred-ninety-two students had left the

pipeline at the point of that analysis (147 responses could be classified clearly). We compared those students' reasons for changing plans, as reported in the previous manuscript, to the reasons students gave in the present study for changing plans within the biomedical pipeline. Table S12 reports the results. As can be seen in the table, there was a significant difference in the proportion of students reporting changing plans due to attraction versus disenchantment between the two samples. In this analysis students who graduated with biomedical majors but did not pursue biomedical career paths ($N = 76$) and students who did not graduate college ($N = 4$) were not included because their interviews had not been coded as part of either research project.

Analyses Controlling for Intervention versus Control Condition and Study

The analyses reported in the manuscript do not control for whether or not students in the study received intervention or control conditions or from what broader research project they were drawn. This choice was made in order the present the focal analyses in as clear of terms as possible to all readers. However, as a robustness check of findings we ran all comparisons as logistic regressions controlling for whether students were in intervention versus control conditions, along with which study students participated in. We used a set of five orthogonal contrast codes for these controls: (a) Fall 2012-2014 project (+1) vs. Fall 2011 project (-1); (b) Fall 2011 values affirmation (VA) intervention (+1) versus none (-1); (c) Fall 2012-2014 utility value (UV) intervention (+1) versus none (-1); (d) Fall 2012-2014 VA (+1) intervention vs. none (-1); (e) Fall 2012-2014 UV intervention x VA intervention.

To accomplish this goal, we ran each chi-square analysis tested in the paper (gender x type of change, URM status x type of change, gender x disenchantment vs. attraction, URM status x disenchantment vs. attraction, and type of change x disenchantment vs. attraction) as a logistic regression model, predicting the second variable listed from the first. In analyses using the type of change variable as an outcome, which had four categories, we ran multinomial logistic regression models. Gender and URM status were contrast-coded for analyses (female = -1; male = +1; majority = -1; URM = +1). In analyses using the type of change variable as a predictor, we ran four separate logistic regression models using each type of change as a predictor in its own model (no change in plans versus change, change to career requiring same amount of education vs. all others, change to career requiring more years of education vs. all others, change to career requiring fewer years of education vs. all others).

Results are reported in Tables S13-S23. As can be seen, all significant effects reported in the text did not change as a function of controlling for experimental condition and which research project students participated in. The gender effect on raising career aspirations became significant in the logistic regression models whereas it was not significant in the crosstabs analyses, but we did not interpret this finding because it was not significant across all tests.

Career and Major Classification Schemes

Table S24 reports a full list of the different career titles in O*Net which were represented in our sample, whether they were classified as biomedical or not, and what the modal educational aspiration level was for that career. For a list of the different majors that are possible at the university and whether they were classified as biomedical or not, see the original study developing this scheme (*17*)**.**

Table S1

List of Questions Asked During Interviews

Question
1. Have you graduated yet? When did you graduate/ when do you plan to graduate?
2. What is/are your majors?
3. What are your plans after graduation?
4. What do you expect to be doing next fall?
5. What do you expect to be doing the following fall?
6. What job or career do you hope to have in 10 years?
7. Are your career plans different now compared to what they were when you started introductory biology?
8. [if plans changed]: How, why, and when did your career plans change?
9. Why are you pursuing your current career goals?

Note: Only interview questions relevant to the research aims are shown. Wording of questions differed slightly across students; during interviews conducted in 2014 ($N = 110$), questions 4,5, and 9 were omitted.

Table S2

Number and Percentage of Students Retained at Two Points Along the STEM Pipeline as a Function of Demographic Categories

Demographic Variable	**Completed Degree in Biomedical Fields (*N* = 997)**	**Planned to Pursue Biomedical Career (*N* = 921)**
	Frequency % of sample	Frequency % of sample
Gender		
Women (*N* = 763)	629	579
	82.4%	75.9%
Men (*N* = 430)	368	342
	85.6%	79.5%
Underrepresented Racial/Ethnic Minority Status		
Underrepresented Racial/Ethnic Minority (*N* = 173)	133	125
	76.9%	72.3%
Majority (*N* = 1020)	864	796
	84.7%	78.0%
Percentage of Total Sample Retained	83.6%	77.5%

Note: Total sample is *N* = 1193 students who intended to study biomedicine at outset of introductory biology course. Underrepresented ethnic minority students were significantly less likely to complete a biomedical degree than majority students, χ^2 (1) = 6.60, p = .010, but the difference in biomedical career plans was not statistically significant, χ^2 (1) = 2.81, p = .094. There were no significant differences as a function of gender.

Table S3

Number and Percentage of Students who Changed Plans within the STEM Pipeline as a Function of Demographic Categories

Demographic Variable	No Change in Biomedical Career Plans (*N* = 499)	Changed Plans Within Biomedical Fields (*N* = 422)	Total
	Frequency %	Frequency %	Frequency
Gender*			
Women	284 49.1%	295 50.9%	579
Men	215 62.9%	127 37.1%	342
Underrepresented Racial/Ethnic Minority Status			
Underrepresented Racial/Ethnic Minority	59 47.2%	66 52.8%	125
Majority	440 55.3%	356 44.7%	796

Note: N= 921 students planning to pursue careers in biomedical fields. *significant chi-square test for gender, χ^2 (1) = 16.53, $p < .001$. Women were significantly more likely to report changing career plans while staying in biomedical fields, compared to men.

Table S4

Biomedical Career Plan Trajectories: Changes to Years of Postgraduate Education Planned by Gender and Ethnicity

	Type of Career Plan Change				
Demographic Variable	**No Change to Career Plans**	**Changed, but Same Level of Education**	**Changed to More Years of Education**	**Changed to Fewer Years of Education**	**Total**
Gender					
Women	284	149	28	118	579
	49.1%[a]	25.7%	4.8%	20.4%[a]	
Men	215	79	9	39	342
	62.9%[b]	23.1%	2.6%	11.4%[b]	
Underrepresented Racial/Ethnic Minority Status					
Underrepresented Racial/Ethnic Minority	59	35	8	23	125
	47.2%	28.0%	6.4%	18.4%	
Majority	440	193	29	134	796
	55.3%	24.2%	3.6%	16.8%	

Note: N = 921 students planning to pursue careers in biomedical fields at graduation.
The overall chi-square value for the test comparing men and women across the categories of aspirations changing was significant at $p < .001$. Superscript letters indicate proportions that are significantly different from one another between levels of a demographic category. Men were significantly more likely to retain consistent career plans than women, χ^2 (1) = 16.48, $p < .001$, and women were significantly more likely to change to career plans that required fewer years of post-graduation education, χ^2 (1) = 12.30, $p < .001$. There were no other significant differences as a function of gender or underrepresented ethnic minority status

Table S5

Number and Percentage of Students Who Perceived Change in Plans as Due to Attraction, Disenchantment or Both as a Function of the Type of Educational Aspiration Change

	Change in Career Plans Due to Disenchantment vs. Attraction		
Type of Career Plan Change	**Attraction**	**Disenchantment**	**Total**
Changed, but Same Level of Education*	124 59.9%	83 40.1%	207
Changed to More Years of Education	18 64.3%	10 35.7%	28
Changed to Fewer Years of Education*	44 31.2%	97 68.8%	141
Total	186	190	376

Note: $N = 376$ students who changed career plans within biomedicine and whose interview responses could be classified. Chi square value was significant for table at $p < .001$. * indicates that proportions are significantly different between attraction and disenchantment for a given level of career plan change. Students who changed but aspired to the same level of education or who raised their educational aspirations were significantly more likely to reference attraction compared to disenchantment, χ^2 (1) = 16.19, $p < .001$ and χ^2 (1) = 4.50, $p = .034$, whereas students who aspired to fewer years of education were significantly more likely to reference disenchantment compared to attraction, χ^2 (1) =39.73, $p < .001$. There were no significant differences among students who changed to a career requiring more years of education.

Table S6

Number and Percentage of Students Who Perceived Change in Plans as Due to Attraction, Disenchantment or Both as a Function of Demographic Categories

	Change in Career Plans Due to Disenchantment vs. Attraction		
Demographic Variable	**Attraction**	**Disenchantment**	**Total**
Gender			
Women	129	134	263
	49.0%	51.0%	
Men	57	56	113
	50.4%	49.6%	
Underrepresented Racial/Ethnic Minority Status			
Underrepresented Racial/Ethnic Minority	29	27	56
	51.8%	48.2%	
Majority	157	163	320
	49.1%	50.9%	

Note: $N = 376$ students who changed career plans within biomedicine and whose interview responses could be classified. Chi-square tests comparing group membership by the given demographic category were not significant.

Table S7

Educational Aspirations at Baseline and Time of Interview

Students Who Changed Career Plans				
	Educational Aspirations at Time of Interview			
Baseline Aspirations	**Bachelors Degree**	**Masters Degree**	**Professional or Doctoral Degree**	**Total**
Undecided	9 (25%)	16 (44.4%)	11 (30.6%)	36
Bachelor's Degree	29 (59.2%)	12 (24.5%)	8 (16.3%)	49
Master's Degree	11 (37.9%)	14 (48.3%)	4 (13.8%)	29
Professional or Doctoral Degree	50 (16.2%)	96 (31.2%)	162 (52.6%)	308
Total	99 (23.5%)	138 (32.7%)	185 (43.8%)	422

Students Who Did Not Change Career Plans				
	Educational Aspirations at Time of Interview			
	Bachelors Degree	**Masters Degree**	**Professional or Doctoral Degree**	**Total**
Total	42 (8.4%)	75 (15.0%)	382 (76.6%)	499

Note: $N = 921$ students planning to pursue careers in biomedical fields. Individuals planning to pursue doctoral degrees in addition to other substantive degrees (e.g., an M.D. and a Ph.D.) were classified as having professional or doctoral aspirations.

Table S8

Educational Aspirations at Baseline and Time of Interview Broken Down by Gender

Students Who Did Change Plans								
	Educational Aspirations at Time of Interview							
Baseline Aspirations	**Bachelors Degree**		**Masters Degree**		**Professional or Doctoral Degree**		**Total**	
	Women	Men	Women	Men	Women	Men	Women	Men
Undecided	7 (26.9%)	2 (20.0%)	14 (53.8%)	2(20.0%)	5 (19.2%)	6 (60.0%)	26	10
Bachelors Degree	17 (53.1%)	12 (70.6%)	8 (25.0%)	4 (23.5%)	7 (21.9%)	1 (5.9%)	32	17
Masters Degree	9 (39.1%)	2 (33.3%)	11 (47.8%)	3 (50.0%)	3 (13.0%)	1 (16.7%)	23	6
Professional or Doctoral Degree	35 (16.4%)	15 (16.0%)	74 (34.6%)	22 (23.4%)	105 (49.1%)	57 (60.6%)	214	94
Total	68 (23.1%)	31 (24.4%)	107 (36.3%)	31 (24.4%)	120 (40.7%)	65 (51.2%)	295	127

Students Who Did Not Change Plans								
	Educational Aspirations at Time of Interview							
	Bachelors Degree		**Masters Degree**		**Professional or Doctoral Degree**		**Total**	
	Women	Men	Women	Men	Women	Men	Women	Men
Total	18 (6.3%)	24 (11.2%)	60 (21.1%)	15 (7.0%)	206 (72.5%)	176 (81.9%)	284	215

Note: $N = 921$ students planning to pursue careers in biomedical fields. Percentages in parentheses represent percentage of the female or male changers or non-changers, respectively, who began with the designated category of career aspirations. Individuals planning to pursue doctoral degrees in addition to other substantive degrees (e.g., an M.D. and a Ph.D.) were classified as having professional or doctoral aspirations.

Table S9

Educational Aspirations at Baseline and Time of Interview Broken Down by Ethnicity

Students Who Did Change Plans								
	Educational Aspirations at Time of Interview							
Baseline Aspirations	**Bachelors Degree**		**Master's Degree**		**Professional or Doctoral Degree**		**Total**	
	URM	Majority	URM	Majority	URM	Majority	URM	Majority
Undecided	2 (50.0%)	7 (21.9%)	1 (25.0%)	15 (46.9%)	1 (25.0%)	10 (31.3%)	4	32
Bachelors Degree	4 (50.0%)	25 (61.0%)	3 (37.5%)	9 (22.0%)	1 (12.5%)	7 (17.1%)	8	41
Master's Degree	1 (25.0%)	10 (40.0%)	1 (25.0%)	13 (52.0%)	2 (50.0%)	2 (8.0%)	4	25
Professional or Doctoral Degree	8 (16.0%)	42 (16.3%)	14 (28.0%)	82 (31.8%)	28 (56.0%)	134 (51.9%)	50	258
Total	15 (22.7%)	84 (23.6%)	19 (28.8%)	119 (33.4%)	32 (48.5%)	153 (43.0%)	66	356

Students Who Did Not Change Plans								
	Educational Aspirations at Time of Interview							
	Bachelors Degree		**Master's Degree**		**Professional or Doctoral Degree**		**Total**	
	URM	Majority	URM	Majority	URM	Majority	URM	Majority
Total	4 (6.8%)	38 (8.6%)	3 (5.1%)	72 (16.4%)	52 (88.1%)	330 (75.0%)	59	440

Note: $N = 921$ students planning to pursue careers in biomedical fields. Percentages in parentheses represent percentage of the female or male changers or non-changers, respectively, who began with the designated category of career aspirations. Individuals planning to pursue doctoral degrees in addition to other substantive degrees (e.g., an M.D. and a Ph.D.) were classified as having professional or doctoral aspirations.

Table S10

Retention of Doctoral-Level Career Aspirations from Baseline through the Time of Interview, Broken Down by the Intersection of Gender and Ethnicity

Percent Retaining Doctoral-Level Aspirations			
Gender	**URM Status**		**Total**
	URM	Majority	
Women	48	263[a]	311[a]
	76.2%	73.7%	74.0%
Men	32	201[b]	233[b]
	82.1%	87.0%	86.3%
Total	80	464	544
	78.4%	78.9%	78.8%

Note: At baseline, the number of students in each group reporting doctoral-level aspirations was: URM Women = 63; URM Men = 39; majority women = 357; majority Men = 231; Women = 420; Men = 270; URM = 102; majority = 588; Total = 690. Percentages in table represent percentage of students still reporting doctoral-level aspirations at final interview, for students who had reported doctoral aspirations at baseline, both within each sub-group and overall for women and men, and for URM and majority students. Superscript letters indicate proportions that are significantly different from one another between men and women in each category. Men were significantly more likely to retain doctoral-level career aspirations than women among majority students, χ^2 (1) = 14.89, $p <$ .001, and overall, χ^2 (1) = 14.87, $p <$ .001; there was not a significant gender difference among URM students.

Table S11

Final Career Choices for Students Who Initially Planned to Attend Medical School but Changed Plans to Biomedical Careers Requiring Fewer Years of Education

Final Career Aspiration	**Total** (*N* = 99)		**Women** (*N* = 72)		**Men** (*N* = 27)	
Physician Assistant	30	30.3%	26	36.1%	4	14.8%
Nurse/Nurse Practitioner/Nurse Anesthetist	15	15.2%	13	18.1%	2	7.4%
Biomedical Researcher (plans exclude Ph.D.)	10	10.1%	5	6.9%	5	18.5%
Natural Sciences Manager	7	7.1%	1	1.4%	6	22.2%
Community Health Workers	5	5.1%	5	6.9%	0	0.0%
Environmental Scientist or Specialist	3	3.0%	2	2.8%	1	3.7%
Forest and Conservation Technician	2	2.0%	1	1.4%	1	3.7%
Occupational Therapist	1	1.0%	1	1.4%	0	0.0%
Dietitian or Nutritionist	1	1.0%	1	1.4%	0	0.0%
Nurse Assistant	1	1.0%	0	0.0%	1	3.7%
Midwife	1	1.0%	1	1.4%	0	0.0%
Histotechnologist	1	1.0%	1	1.4%	0	0.0%
Farm and Ranch Manager	1	1.0%	1	1.4%	0	0.0%
Epidemiologist	1	1.0%	1	1.4%	0	0.0%
Anesthesiologist Assistant	1	1.0%	1	1.4%	0	0.0%
Vague Future Plans	19	19.2%	12	16.7%	7	25.9%

Note: N = 99 students who indicated pre-medical aspirations at baseline and intended to pursue biomedical career paths after graduating college, but lowered their career aspirations. Percentages reflect the percentage of each gender group or percentage of the total sample. The "Vague Future Plans" category refers to students who no longer planned to attend medical school, but had maintained interest in biomedical career paths either in the short term or in a general sense without specifying a particular long-term biomedical career path. Significance testing was not conducted on gender differences in career choices due to low expected cell counts.

Table S12

Comparing Reasons for Changing Future Plans Between Students Who Remained in versus Left the Biomedical Pipeline

	Change in Career Plans Due to Disenchantment vs. Attraction		
Group	**Attraction**	**Disenchantment**	**Total**
Changed Plans within Biomedical Pipeline	186 49.5%	190 50.5%	376
Left Biomedical Fields of Study	37 25.2%	110 74.8%	147
Total	223	300	523

**Note*: $N = 523$ students who either changed career plans within biomedicine or who left biomedical fields prior to graduation, and whose interview responses could be classified. Data for those who left comes from a previous study (*13*). Students remaining in the pipeline were significantly more likely to report doing so due to attraction versus disenchantment, χ^2 (1) = 25.51, $p < .001$.

Table S13

Gender Predicting Likelihood of Graduating with a Degree in Biomedical Fields

Predictor	B	S.E.	Wald	Sig.
Intercept	-1.66	0.08		
Gender	-0.12	0.08	1.94	.164
F12-14 vs. F11	0.11	0.06	3.55	.060
F11 VA v. C	0.05	0.14	0.15	.703
F12-14 UV v. C	0.01	0.10	0.01	.937
F12-14 VA v. C	-0.07	0.10	0.55	.461
F12-14 UV v. C x VA v. C	-0.06	0.10	0.33	.563

Note: *N* = 1193. Gender: Male = +1, Female = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S14

URM Status Predicting Likelihood of Graduating with a Degree in Biomedical Fields

Predictor	B	S.E.	Wald	Sig.
Intercept	-1.47	0.10		
URM Status	0.23	0.10	5.33	.021
F11 VA v. C	0.09	0.06	2.65	.103
F12-14 UV v. C	0.05	0.14	0.14	.713
F12-14 VA v. C	0.01	0.10	0.01	.932
F12-14 UV v. C x VA v. C	-0.07	0.10	0.49	.485
F12-14 vs. F11	-0.06	0.10	0.34	.559

Note: *N* = 1193. URM Status: URM = +1, Majority = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S15

Gender Predicting Likelihood of Continued Pursuit of Biomedical Career Plans

Predictor	B	S.E.	Wald	Sig.
Intercept	-1.25	0.07		
Gender	-0.11	0.07	2.11	.147
F12-14 vs. F11	0.07	0.05	1.89	.170
F11 VA v. C	0.01	0.12	0.01	.930
F12-14 UV v. C	-0.05	0.09	0.32	.573
F12-14 VA v. C	-0.05	0.09	0.37	.545
F12-14 UV v. C x VA v. C	-0.15	0.09	2.77	.096

Note: *N* =1193; Gender: Male = +1, Female = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S16

URM Status Predicting Likelihood of Continued Pursuit of Biomedical Career Plans

Predictor	B	S.E.	Wald	Sig.
Intercept	-1.12	0.09		
URM	0.14	0.09	2.29	.130
F12-14 vs. F11	0.06	0.05	1.46	.228
F11 VA v. C	0.01	0.12	0.01	.932
F12-14 UV v. C	-0.05	0.09	0.32	.571
F12-14 VA v. C	-0.05	0.09	0.35	.557
F12-14 UV v. C x VA v. C	-0.15	0.09	2.74	.098

Note: $N = 1193$. URM Status: URM = +1, Majority = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S17

Gender Predicting Likelihood of Students Changing Career Plans Within Biomedical Fields

Predictor	B	S.E.	Wald	Sig.
Intercept	-0.25	0.07		
Gender	-0.29	0.07	16.89	<.001
F12-14 vs. F11	-0.01	0.05	0.05	.817
F11 VA v. C	-0.09	0.11	0.71	.400
F12-14 UV v. C	0.07	0.09	0.59	.442
F12-14 VA v. C	-0.03	0.09	0.12	.727
F12-14 UV v. C x VA v. C	-0.08	0.09	0.77	.382

Note: $N = 921$. Gender: Male = +1, Female = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S18

URM Status Predicting Likelihood of Students Changing Career Plans Within Biomedical Fields

Predictor	B	S.E.	Wald	Sig.
Intercept	-0.05	0.10		
URM	0.17	0.10	3.01	.083
F12-14 vs. F11	-0.02	0.05	0.22	.637
F11 VA v. C	-0.08	0.11	0.61	.434
F12-14 UV v. C	0.06	0.09	0.47	.494
F12-14 VA v. C	-0.03	0.09	0.11	.742
F12-14 UV v. C x VA v. C	-0.07	0.09	0.57	.451

Note: $N = 921$. URM Status: URM = +1, Majority = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S19

Gender Predicting Likelihood of Making Different Types of Career Plan Changes Within Biomedical Fields, Compared to Maintaining Consistent Career Plans Within Biomedical Fields

Making Same-Level Career Plan Changes				
Predictor	B	S.E.	Wald	Sig.
Intercept	-0.84	0.09		
Gender	-0.19	0.08	5.00	.025
F12-14 vs. F11	0.03	0.06	0.32	.574
F11 VA v. C	-0.06	0.13	0.22	.636
F12-14 UV v. C	0.12	0.10	1.31	.252
F12-14 VA v. C	-0.03	0.10	0.09	.770
F12-14 UV v. C x VA v. C	-0.11	0.10	1.19	.275
Making Changes to Careers Requiring Fewer Years of Education				
Predictor	B	S.E.	Wald	Sig.
Intercept	-1.31	0.11		
Gender	-0.41	0.10	16.14	<.001
F12-14 vs. F11	-0.05	0.06	0.51	.476
F11 VA v. C	-0.19	0.14	1.70	.193
F12-14 UV v. C	-0.03	0.12	0.07	.791
F12-14 VA v. C	-0.09	0.12	0.48	.487
F12-14 UV v. C x VA v. C	0.04	0.12	0.09	.769
Making Changes to Careers Requiring More Years of Education				
Predictor	B	S.E.	Wald	Sig.
Intercept	-2.93	0.25		
Gender	-0.44	0.20	4.85	.028
F12-14 vs. F11	-0.19	0.13	1.96	.162
F11 VA v. C	0.14	0.25	0.32	.572
F12-14 UV v. C	0.34	0.31	1.22	.270
F12-14 VA v. C	0.44	0.31	1.95	.163
F12-14 UV v. C x VA v. C	-0.49	0.31	2.41	.120

Note: $N = 921$. Gender: Male = +1, Female = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S20

URM Status Predicting Likelihood of Making Different Types of Career Plan Changes Within Biomedical Fields, Compared to Maintaining Consistent Career Plans Within Biomedical Fields

Making Same-Level Career Plan Changes				
Predictor	B	S.E.	Wald	Sig.
Intercept	-0.69	0.12		
URM	0.15	0.12	1.66	.198
F12-14 vs. F11	0.02	0.06	0.17	.684
F11 VA v. C	-0.06	0.13	0.19	.659
F12-14 UV v. C	0.12	0.10	1.23	.267
F12-14 VA v. C	-0.03	0.10	0.07	.789
F12-14 UV v. C x VA v. C	-0.11	0.10	1.07	.301
Making Changes to Careers Requiring Fewer Years of Education				
Predictor	B	S.E.	Wald	Sig.
Intercept	-1.07	0.13		
URM	0.13	0.13	0.99	.320
F12-14 vs. F11	-0.05	0.06	0.76	.384
F11 VA v. C	-0.17	0.14	1.50	.221
F12-14 UV v. C	-0.04	0.12	0.13	.716
F12-14 VA v. C	-0.09	0.12	0.50	.481
F12-14 UV v. C x VA v. C	0.05	0.12	0.18	.668
Making Changes to Careers Requiring More Years of Education				
Predictor	B	S.E.	Wald	Sig.
Intercept	-2.52	0.25		
URM	0.41	0.21	3.63	.057
F12-14 vs. F11	-0.21	0.14	2.52	.113
F11 VA v. C	0.15	0.25	0.35	.557
F12-14 UV v. C	0.34	0.31	1.18	.277
F12-14 VA v. C	0.45	0.31	2.04	.153
F12-14 UV v. C x VA v. C	-0.47	0.31	2.31	.128

Note: $N = 921$. URM Status: URM = +1, Majority = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S21

Changing Plans Due to Attraction versus Disenchantment Predicting Likelihood of Making Different Type of Career Plan Changes, Compared to Changing Plans to Careers Requiring the Same Level of Education

Making Changes to Careers Requiring Fewer Years of Education				
Predictor	B	S.E.	Wald	Sig.
Intercept	N/A	N/A		
Attraction versus Disenchantment	N/A	N/A	N/A	N/A
F12-14 vs. F11	N/A	N/A	N/A	N/A
F11 VA v. C	N/A	N/A	N/A	N/A
F12-14 UV v. C	N/A	N/A	N/A	N/A
F12-14 VA v. C	N/A	N/A	N/A	N/A
F12-14 UV v. C x VA v. C	N/A	N/A	N/A	N/A
Making Changes to Careers Requiring More Years of Education*				
Predictor	B	S.E.	Wald	Sig.
Intercept	N/A	N/A		
Attraction versus Disenchantment	N/A	N/A	N/A	N/A
F12-14 vs. F11	N/A	N/A	N/A	N/A
F11 VA v. C	N/A	N/A	N/A	N/A
F12-14 UV v. C	N/A	N/A	N/A	N/A
F12-14 VA v. C	N/A	N/A	N/A	N/A
F12-14 UV v. C x VA v. C	N/A	N/A	N/A	N/A

Note: *N* = 376. F11 vs. F12-14 = Fall, 2011 Study (+1) versus Fall 2012-2014 Study (-1). F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

*Small sample sizes in the number of students who changed to careers requiring more education resulted in the model not being able to converge properly for the category of changing to careers requiring more years of education; thus estimates for the model were not deemed to be valid.

Table S22

Gender Predicting Likelihood of Changing Career Plans Due to Attraction Versus Disenchantment

Predictor	B	S.E.	Wald	Sig.
Intercept	-0.01	0.12		
Gender	0.03	0.11	0.07	.786
F12-14 vs. F11	0.00	0.07	0.00	.970
F11 VA v. C	0.16	0.16	0.98	.321
F12-14 UV v. C	0.06	0.14	0.19	.661
F12-14 VA v. C	-0.01	0.14	0.01	.923
F12-14 UV v. C x VA v. C	0.20	0.14	2.19	.139

Note: *N* = 376. Gender: Male = +1, Female = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S23

URM Status Predicting Likelihood of Students Changing Career Plans Due to Attraction Versus Disenchantment

Predictor	B	S.E.	Wald	Sig.
Intercept	0.00	0.15		
URM	0.04	0.15	0.06	.810
F12-14 vs. F11	0.00	0.07	0.00	.985
F11 VA v. C	0.16	0.16	0.95	.329
F12-14 UV v. C	0.07	0.14	0.23	.629
F12-14 VA v. C	-0.01	0.14	0.01	.932
F12-14 UV v. C x VA v. C	0.20	0.14	2.09	.149

Note: *N* =376. URM Status: URM = +1, Majority = -1. F11 vs. F12-14 = Fall 2011 Study (-1) versus Fall 2012-2014 Study (+1). F11 VA v. C = Fall 2011 VA Intervention (+1) versus Control Condition (-1). F12-14 UV v. C = Fall 2012-2014 UV Intervention (+1) versus Control Condition (-1). F12-14 VA v. C = Fall 2012-2014 VA Intervention (+1) versus Control Condition (-1).

Table S24

Career Classification Scheme Used in Present Study

Career Title	Biomedical?	Educational Level
Accountants	No	N/A
Actors	No	N/A
Actuaries	No	N/A
Advertising Sales Agents	No	N/A
Anesthesiologist Assistants	Yes	3
Animal Trainers	No	N/A
Animal Scientists	Yes	4
Architectural and Engineering Managers	No	N/A
Athletic Trainers	Yes	3
Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary	No	N/A
Audiologists	Yes	4.0
Biologists	Yes	4
Biomedical Engineers	Yes	Case by case (default to 2)
Biostatisticians	Yes	4
Child, Family, and School Social Workers	No	N/A
Chiropractors	Yes	4
Biochemists and Biophysicists	Yes	4
Bioinformatics Scientists	Yes	4
Chemists	No	N/A
Chemical Engineers	No	N/A
Civil Engineers	No	N/A
Climate Change Analysts	No	N/A
Clinical Psychologists	No	N/A
Clinical Research Coordinators	Yes	2
Community Health Workers	Yes	Case by case (default to 2)
Computer Network Support Specialists	No	N/A
Computer Programmers	No	N/A
Conservation Scientists	Yes	Case by case (default to 2)
Coroners	Yes	Case by case (default to 2)
Curators	No	N/A
Database Administrators	No	N/A
Dentists	Yes	4
Dietitians and Nutritionists	Yes	Case by case (default to 2)
Editors	No	N/A
Doctors	Yes	4
Education Administrators, Elementary and Secondary School	No	N/A
Educational, Guidance, School, and Vocational Counselors	No	N/A

Elementary School Teachers, Except Special Education	No	N/A
English Language and Literature Teachers, Postsecondary	No	N/A
Environmental Engineers	Yes	3
Environmental Scientists and Specialists	Yes	Case by case (default to 2)
Epidemiologists	Yes	Case by case (default to 2)
Exercise Physiologists	Yes	Case by case (default to 2)
Farm and Ranch Managers	Yes	2
Food Scientists and Technologists	Yes	Case by case (default to 2)
Food Service Managers	No	N/A
Financial Analysts	No	N/A
Financial Managers, Branch or Department	No	N/A
Forensic Science Technicians	No	N/A
Forest and Conservation Technicians	Yes	Case by case (default to 2)
General and Operations Managers	No	N/A
Geneticists	Yes	4
Genetic Technologists	Yes	Case by case (default to 2)
Genetic Counselors	Yes	3
Geoscientists, Except Hydrologists and Geographers	No	N/A
Glass Blowers, Molders, Benders, and Finishers	No	N/A
Healthcare Social Workers	No	N/A
Histotechnologists and Histologic Technicians	Yes	2
Human Resources Managers	No	N/A
Industrial Production Managers	No	N/A
Industrial-Organizational Psychologists	No	N/A
Instructional Coordinators	No	N/A
Insurance Sales Agents	No	N/A
Inspectors, Testers, Sorters, Samplers, and Weighers	No	N/A
Lawyers	No	N/A
Legislators	No	N/A
Management Analysts	No	N/A
Market Research Analysts and Marketing Specialists	No	N/A
Marketing Managers	No	N/A
Materials Scientists	No	N/A
Medical Assistants	Yes	2
Medical Scientists	Yes	4
Medical and Clinical Laboratory Technicians	Yes	2
Medical and Health Services Managers	No	N/A
Mental Health Counselors	No	N/A
Mental Health Social Workers	No	N/A
Microbiologists	Yes	Case by case (default to 2)
Microsystems Engineers	No	N/A
Midwives	Yes	3
Natural Sciences Managers	Yes	Case by case (default to 2)
Naturopathic Physicians	Yes	4

Neuropsychologists and Clinical Neuropsychologists	Yes	4
Neurologists	Yes	4
Nonfarm Animal Caretakers	Case by Case	Case by case (default to 2)
Nurse Anesthetists	Yes	3
Nursing Assistants	Yes	Case by case (default to 2)
Nurse Practitioners	Yes	3
Doctors of Nursing Practice	Yes	4
Nursery and Greenhouse Managers	Yes	Case by case (default to 2)
Occupational Therapists	Yes	Case by case (default to 3)
Optometrists	Yes	4
Oral Surgeons	Yes	4
Orthodontists	Yes	4
Emergency Medical Technicians and Paramedics	Yes	Case by case (default to 2)
Park Naturalists	No	N/A
Pathologists	Yes	4
Personal Financial Advisors	No	N/A
Pharmacists	Yes	4
Photographers	No	N/A
Physical Therapists	Yes	4
Physician Assistants	Yes	3
Private Detectives and Investigators	No	N/A
Professors	Case by case	Case by case (default to 2)
Producers	No	N/A
Public Relations Specialists	No	N/A
Quality Controls System Managers	Yes	Case by case (default to 2)
Real Estate Brokers	No	N/A
Recreation Workers	No	N/A
Registered Nurses	Yes	2
Rehabilitation Counselors	No	N/A
Remote Sensing Scientists and Technologists	Yes	Case by case (default to 2)
Reporters and Correspondents	No	N/A
Secondary School Teachers, Except Special and Career/Technical Education	No	N/A
School Psychologists	No	N/A
Secretaries and Administrative Assistants	No	N/A
Social and Human Service Assistants	No	N/A
Soil and Plant Scientists	Yes	4
Software Developers, Systems Software	No	N/A
Speech-Language Pathologists	No	N/A
Statisticians	No	N/A
Substance Abuse and Behavioral Disorder Counselors	No	N/A
Surgeons	Yes	4
Technical Directors/Managers	No	N/A
Urban and Regional Planners	No	N/A
Veterinarians	Yes	4
Veterinary Technologists and Technicians	Yes	Case by case (default to 2)

Veterinary Assistants and Laboratory Animal Caretakers	Yes	Case by case (default to 2)
Web Developers	No	N/A
Zoologists and Wildlife Biologists	Yes	Case by case (default to 3)
Water Resource Specialists	Yes	Case by case (default to 2)
Writers and Authors	No	N/A
General Biomedical Career	Yes	Case by Case
General Non-Biomedical Career	No	N/A

Note: Classifications are based on the O*Net career titles mentioned by students in our sample, and they do not represent all possible career titles available in the O*Net database. Some career titles in this list were created by the research team to capture a category of O*Net career titles (e.g., Doctor, instead of different doctor specialties; Professor, instead of different types of professors or instructors) rather than using each specific career in that category. Additionally, we created two categories of careers to capture the career plans of students who had broad plans or plans that were not frequently noted in the sample but were clearly non-biomedical (i.e., General Biomedical Career, General Non-Biomedical Career). In cells indicating case by case decisions, we chose not to use the O*Net classifications for level of education because the career indicated was broad in nature and could be classified in multiple ways; instead we relied on students' entire interviews to classify students' choices.

Data Files Provided Along with Manuscript

1. Data S1: “RosenzweigETAl.WithinPipeline.DataFromManuscript.csv”
   This file contains the data used in the analyses from the manuscript. It is provided as a .csv file along with the manuscript.
2. Data S2: “Codebook for Rosenzweig et al. Within Pipeline Paper Data.xlsx”
   This file contains information about the variables included in the data file. It is provided as an Excel file along with the manuscript.