

# How to Increase CMU Advising Survey Response Rate?

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## Introduction

- CMU regularly administers a survey to undergraduate and graduate students about their experience with advisors
- Like most surveys in higher education, there is a lot of non-response. CMU is exploring ways to improve survey response while simultaneously examining the impact of non-response bias on subsequent analysis and reporting
- As one way to increase response, CMU offered small prize incentives university wide to students who filled out the survey
- Some colleges offered additional incentives. CMU would like to know if the incentives caused an increase in response

We address two research questions for this project:

1. What was the impact of incentives on Advising Survey response rates?
2. Are there differences in overall Advising Survey response rates across student population(s)?

## Data

- Our data includes all undergraduate and Master's students at CMU in Spring 2022 (6587 undergrads, 4863 grads).
- We have some demographic information on each student, as well as to what extent they responded to the survey.

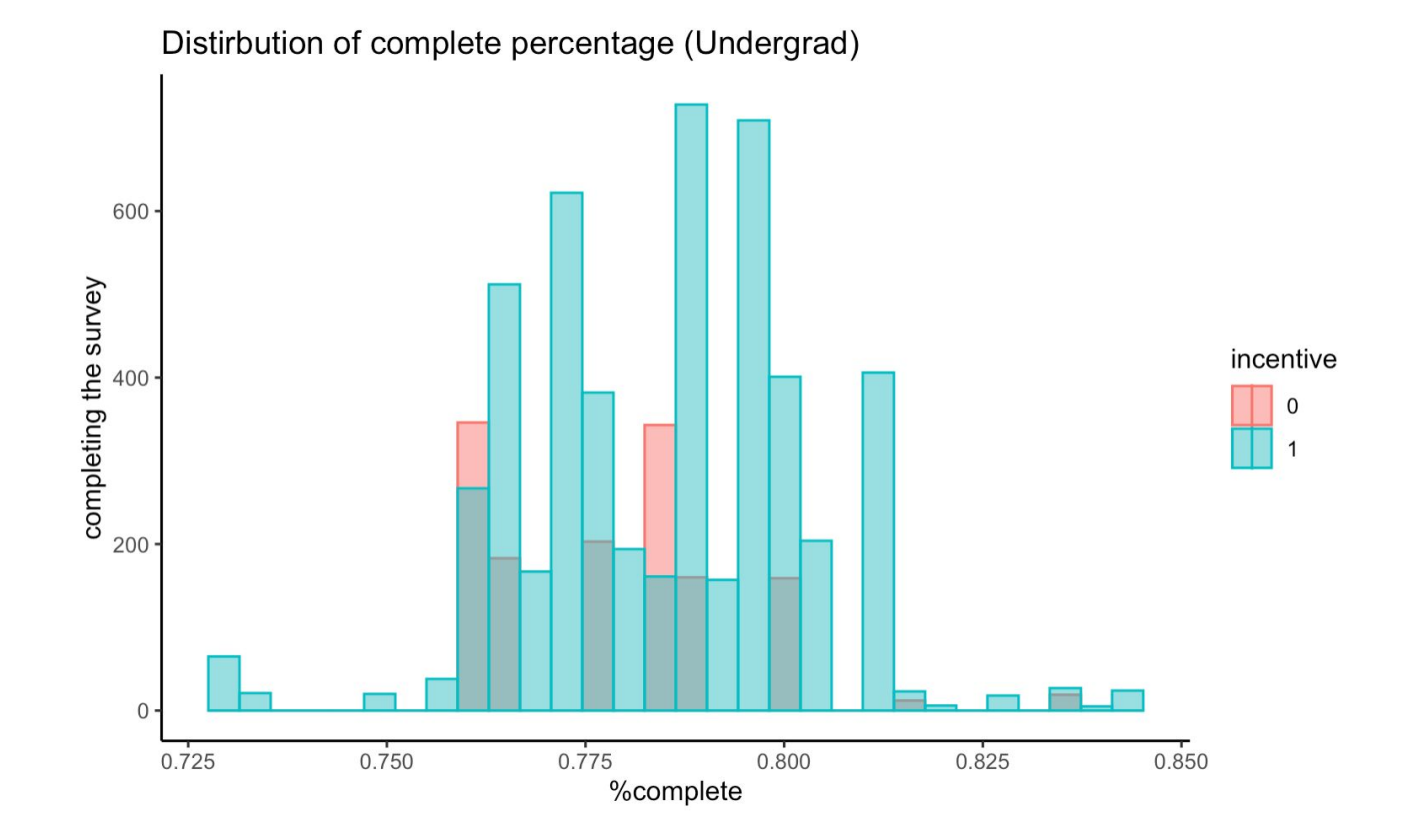
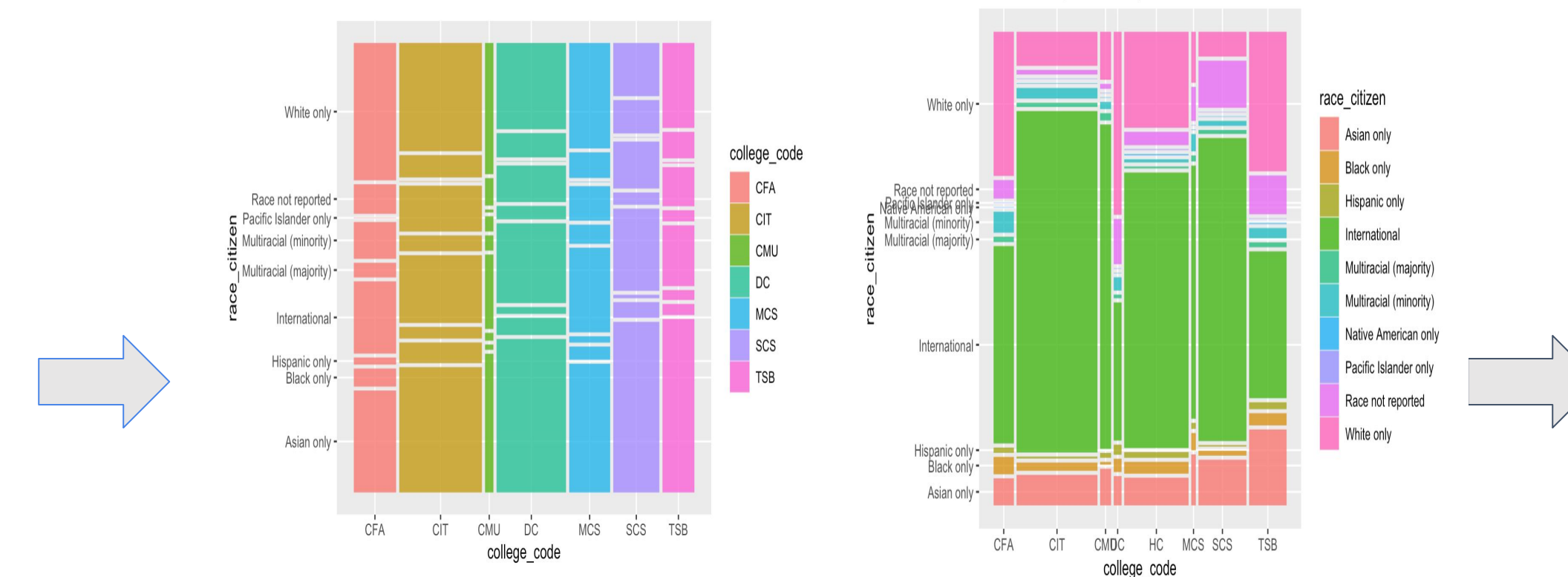
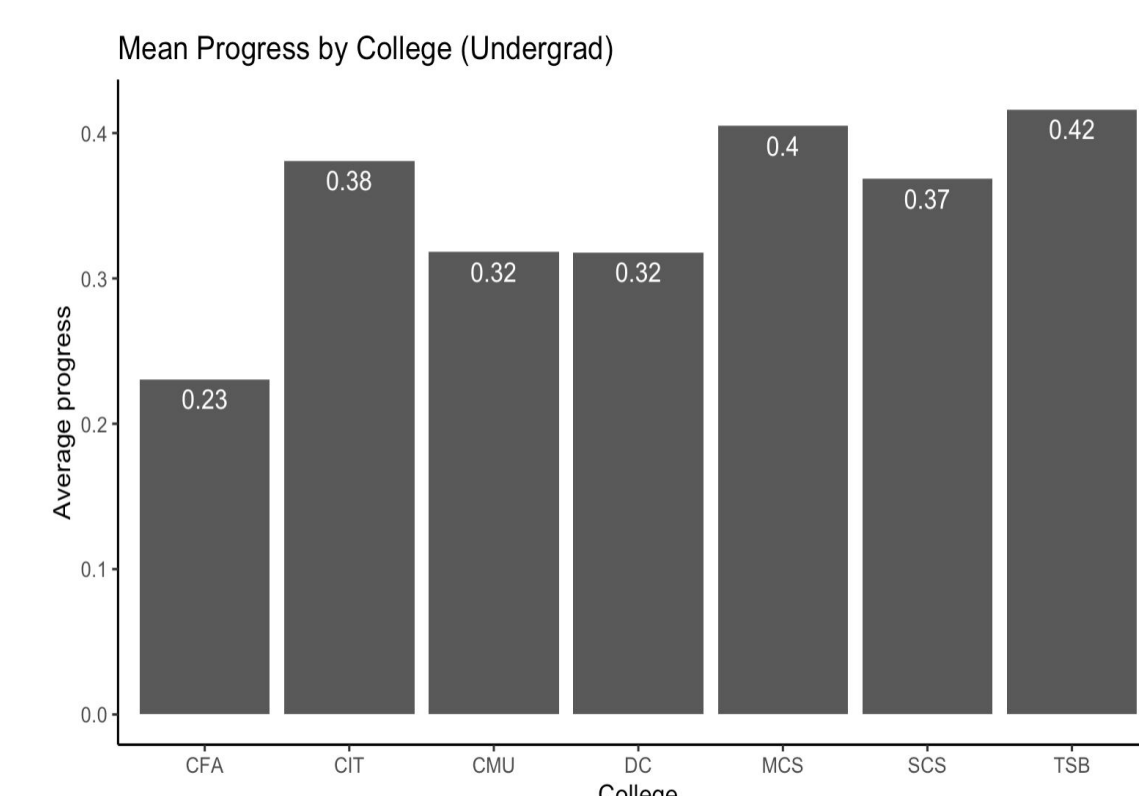
Variable(s)	Description
Response	Whether the student has completed the survey or not (0 not complete, 1, complete)
% Complete	Percentage of survey completion: >=78% is completion mark
class/year	Student's class (Undergrad: 1-5, Grad: 10)
sex	Students' sex: M~male, F~female
first_gen/grad	Whether student is a first generation/first grad student (0 no, 1 yes)
international	Whether student is an international student (0 no, 1 yes)
pell	Whether the student received the pell grant(only applicable for undergraduates)
race	race based on the ipeds race standards, including White, Hispanic, Hawaiian and Pacific Islander, etc.
college_code	College the student is in
Start/end date	Start/end date and time of the survey
Incentive	manually created, whether the student received an incentive from their college. All students received a university wide incentive but this variable focuses on the college incentives. <ul style="list-style-type: none"> <li>• Undergraduate students, only Dietrich College students <b>DO NOT</b> received college incentives</li> <li>• For graduate students, only the students from CIT received the incentive.</li> </ul>

## Methods

- Goal: If the incentive can cause an increase in response rate.
- Challenge: There are demographic differences among students who received the incentive and those who did not. These demographic differences confound causal effects (correlation does not imply causation).
- We chose logistic regression for binary classification. Here are several ways we address this challenge:
  - Model1: Logistic regression model of survey complete against incentive with interactions among students class and demographics.
  - Model2: Logistic regression model of survey complete against incentive controlling confounding effect of student demographics.
  - Model3: Logistic regression model that is identical to model 2 but using data after conducting matching(1:1 matching, caliper matching)
  - Model4: Logistic regression model to predict the demographics who are more likely to respond before college incentive announcement

## Analyses

### Results from our EDA

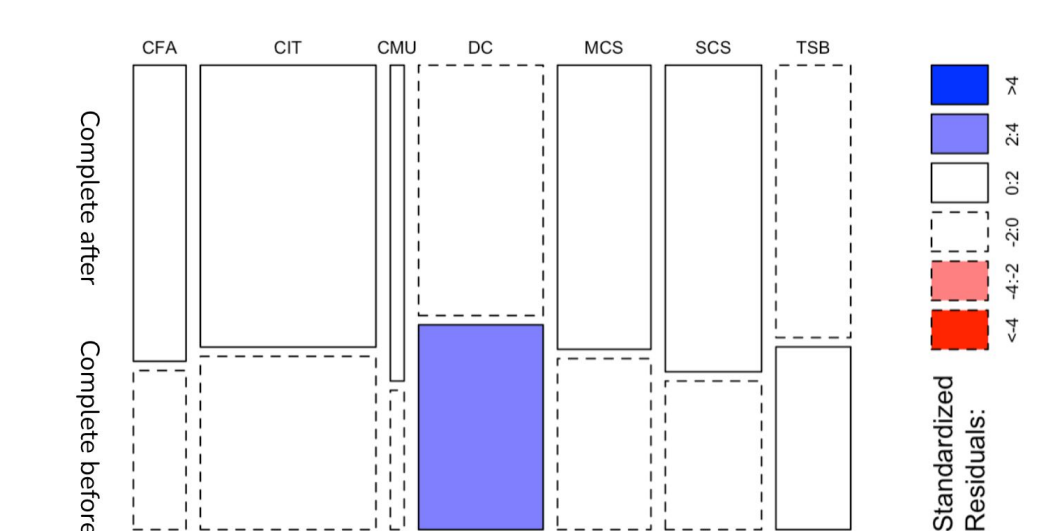
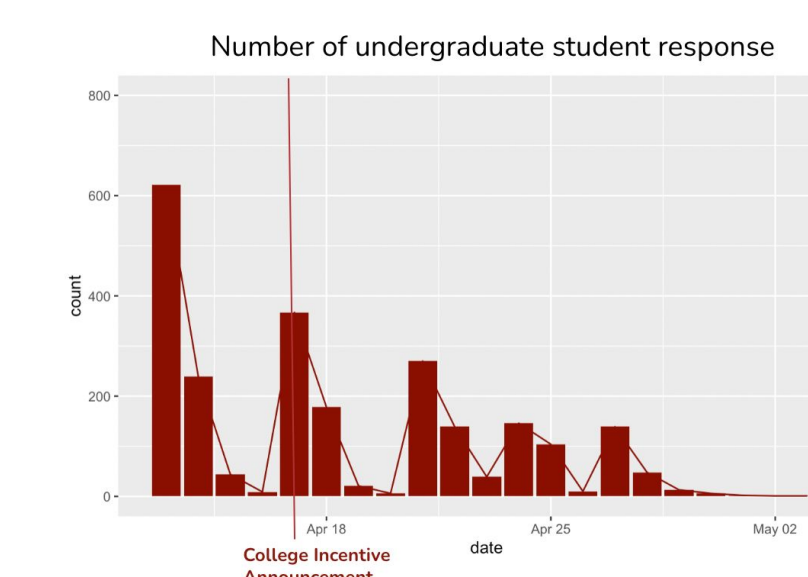


Intuitively we would think that incentive may be helpful because DC college without incentive shows a lower survey completion rate

However, students in different college have different demographics that can also affect survey completion thus can confuse the effectiveness of incentive.

After controlling for confounders, we can safely arrive the conclusion about causation between incentive and survey completion.

- The relationship between survey completion rates and incentive showed similar results for models 2 and 3. In other words, the results before and after performing matching on the data are communicating that the incentives help survey completion for undergraduates and that the incentives do not for graduate students.
- Male and International students tend not to complete the survey until the college incentives is announced. First generation college students tend to complete the survey right after university incentive announcement.



## Conclusion

- Incentive can improve odds of survey completion for undergraduate students (20x), but is of no help for graduate students (0.316x the odds).
  - Undergraduate students who received the pell grant, who are first generation students, Black students and students with two or more races received a lower positive effect due to incentives.
  - Graduate international students are less negatively affected by the incentives.
- Students with certain demographics features, such as older students, male students, are less likely to complete the survey.
- Male and International students need extra incentives to be motivated to complete the survey or they simply tend not to respond in a timely manner