Gender Dynamics in Academia: Analyzing Regrade Requests and Course Load Trends, 2010-2016*

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Academia often aggravates gender differences. This paper then aims to explore the gendered nature of regrade requests by undergraduate students at Colorado State University from 2010-2016. Through analyzing changes in regrade request patterns, regrade outcomes, and instructors' gender identity, our results show that on average male students are more likely to submit regrade requests, and are more likely to have better grade changes compared to female students. In contrast, extrapolation on the original study suggests that both female and male instructors are more likely to favourably regrade female students, which raises interesting questions on gender dynamics in the college setting.

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*Code and data are available at: https://github.com/ponolite/gender_grade.git, DOI: https://doi.org/10.48152/ssrp-bjze-cn68

1 Introduction

It's a social norm that we consider men to be assertive and dominant, while women nurturing and supportive. Often, women who choose to break out of these stereotypes are labelled 'emotional' or 'aggressive', hindering their professional mobility (Edwards 2023). Even in academic settings, women tend to be penalized when achieving better grades and opportunities. A study conducted by Natasha Quadlin, suggests that due to traditional, gendered stereotypes, women's academic achievements are often disregarded compared to their male counterparts when both enter the labour market. Men of 'high-achieving' academic backgrounds tend to get favourable callbacks for interviews compared to their female counterparts with the same credentials (Quadlin 2018).

As such, whether or not these unequal tendencies exist in higher education for women-especially in the context of requesting regrade-is an important question to ask. There is already much research attempted to answer this problem space. First, being subjected to social norms, women tend to be more non-confrontational, resulting in them accepting their academic results as they are instead of fighting for them (Edwards 2023). Second, with differing confidence levels and personalities, women tend to second-guess their abilities, hence preventing them from requesting aid from their institutions as they see the entire process as 'tedious' and "unnecessary' (Quadlin 2018). Lastly, fear of rejection and being viewed negatively by instructors, women tend to harbor higher levels of stress when considering regrades (Quadlin 2018). A paper published by the American Journal of Political Science by Li and Zahar focuses into the gendered differences in regrade outcomes among college students from Colorado State University from 2010 to 2016. According to their findings, male students are more likely to request grade changes than their female counterparts. Regardless of the class number as well, males are more likely to ask for regrades throughout the semester (Valbrun 2020). Overall, there is a gender disparity among college students regarding regrade requests.

Then, while the paper, 'Ask and You Shall Receive? Gender differences in Regrades in College' by Li and Zafar focuses on students' gender and regrades, we moreso look into the estimand that, upon a regrade request, whether or not an instructor's gender identity–when interacted with a student's gender identity–affects the regrade outcome. Our study attempts to answer this question, 'Is there a correlation between instructor's gender and the regrading process?' Hence, by examining biases inherent within higher education, the paper aims to assess the relationship between regrade requests and gender identity, especially the complex dynamics between instructors' and students' gender identity.

Structurally, in Section 1, our paper starts with a brief dissection of the original paper's findings and our interpretation of the data. Subsequently, in Section 2 and Section 3, we analyze the results garnered from the data with suitable tables and double-stacked bar charts. Finally, to conclude, we will discuss our findings in Section 4, which entailed an analysis of the data's loopholes, ethical biases and future research implications.

Our replication package was sourced from the openICPSR Portal under the library `readstata13` package (Garbuszus and Jeworutzki 2023). We retrieved two datasets– 'instsurvey.dta' and 'stdsurvey.dta'– and one code file–'1_FiguresTables.do'–from the data package 'DataCode' to examine gender identities of undergraduate students from Colorado State University from 2010 to 2018 and their correlation to regrade requests (Li and Zafar 2023). Data was generated, extracted and cleaned using the open-source statistical programming language R (R Core Team 2022), leveraging functions from `tidyverse` (Wickham et al. 2019), `ggplot2` (Wickham 2016), `dplyr` (Wickham et al. 2022), `readr` (Wickham, Hester, and Bryan 2022), `tibble` (Müller and Wickham 2022), `janitor` (Firke 2021), `kableExtra` (Zhu 2021), and `knitr` (Xie 2014).

2 Data

This paper reproduced the paper 'Ask and You Shall Receive? Gender Differences in Regrades in College' and its replication package published on `openICPSR` (University of Michigan 2024). This data package conveys information related to survey data from instructors and students on the pervasiveness of regrade requests based on gender identities from 2010 to 2018. Particularly, 'instsurvey.dta' contains all 190 observations of actual regrade requests in 2018, along with 61 variables concerning the nature of each regrade request and whether or not each instance initiated grade changes. On the other hand, 'stdsurvey.dta' conveys all 3885 observations of student surveyees who have contemplated requesting regrades, with 52 variables detailing instances where they didn't initiate such requests. With these two datasets representing two perspectives on regrade requests, there is much power dynamic to unpack, helping this paper assess the gendered nature of regrade requests in the undergraduate setting.

2.1 Instructor Survey Data

Most prominent to our reproduction lies in the tactile grade changes of regrade requests based on each student's gender identity. As such, we first simplified 'instsurvey.dta', which featured 190 observations. We cleaned the data by selecting relevant variables such as "maleup_fn", "malesame_fn", "maledown_fn", "femaleup_fn", "femalesame_fn", "femaledown_fn", "maleup_mt", "malesame_mt", "maledown_mt", "femaleup_mt", "femalesame_mt", "femaledown_mt" and "inst_gender". The respective variables provide data on the number of male and female students whose grades increased, stayed the same or decreased both during and at the end of the semester along with the instructor's gender in each case. We further

Table 1: Table of Instructor Survey Regrade Results by Timing and Students' Gender

Male: Final Grade Increase	Male: Final Grade Same	Male: Final Grade Decrease
18.48592	80.26761	1.246479
Female: Final Grade Increase	**Female: Final Grade Same**	**Female: Final Grade Decrease**
19.98561	79.1295	0.8848921
Male: During Semester Grade Increase	**Male: During Semester Grade Same**	**Male: During Semester Grade Decrease**
36.99371	61.78616	1.220126
Female: During Semester Grade Increase	**Female: During Semester Grade Same**	**Female: During Semester Grade Decrease**
39.6125	59.25625	1.13125

modified the data by calculating the mean of each variable using the mean() function. The mean is needed to determine the percentage of male or female students who received a grade increase, decrease, or no change. A new data frame is then created per focus area. In total four graphs were created to show the percentage of male and female students who received a grade increase, decrease, or no change after requesting for a regrade both during and at the end of the semester.

Further, to analyze the differences in favorable regrades amng male and female instructors, we renamed the original variable, "inst_female" into "inst_gender". We also changed "0" into "Male" and "1" into "Female to clarify the dataset. After that, we attempt to create four bar graphs and two scatter-plots to assess the correlation between instructors' gender and favorable regrades.

2.2 Student Survey Data

Conversely, the 'stdsurvey.dta' dataset featured 3885 observations of all potential regrade requests, which provided us with insights into gender identity and student psychology when approaching regrades. To simplify the data, we first clean its names and select relevant variables, including 'std_male', 'consider_regrade', 'num_class' and 'participantcode' which respectively convey data on students' gender, whether or not they have considered regrading, the number of classes they have considered regrades and identification. For 'std_male', a '1' signifies a male student while a '0' signifies a female student; in which, to clean the dataset, we've renamed the column to 'gender' and modified '1' to be 'Male' while '0' to be 'Female'.

To garner data on students who considered regrading, we used `filter` to get rid of observations with 'No' for their 'consider_regrade' column. `mutate` was also leveraged to generate a column on 'percentage' of students who considered regrading (Table 6). Proceedingly, we used the cleaned data to generate a double-stacked bar chart of the percentage of female and male students who considered regrading for each category of the number of classes.

Table 6: Table of Number of Classes Students Considered for Regrade Requests by Students' Gender

Number of Classes	Gender	Consider Regrade	Count	Percentage
0 class	Female	Yes	716	41.2
0 class	Male	Yes	336	39.3
1 class	Female	Yes	528	30.4
1 class	Male	Yes	194	22.7
2 classes	Female	Yes	298	17.2
2 classes	Male	Yes	176	20.6
3 classes	Female	Yes	124	7.1
3 classes	Male	Yes	76	8.9
4 classes	Female	Yes	34	2.0
4 classes	Male	Yes	28	3.3
5 classes	Female	Yes	36	2.1
5 classes	Male	Yes	44	5.2

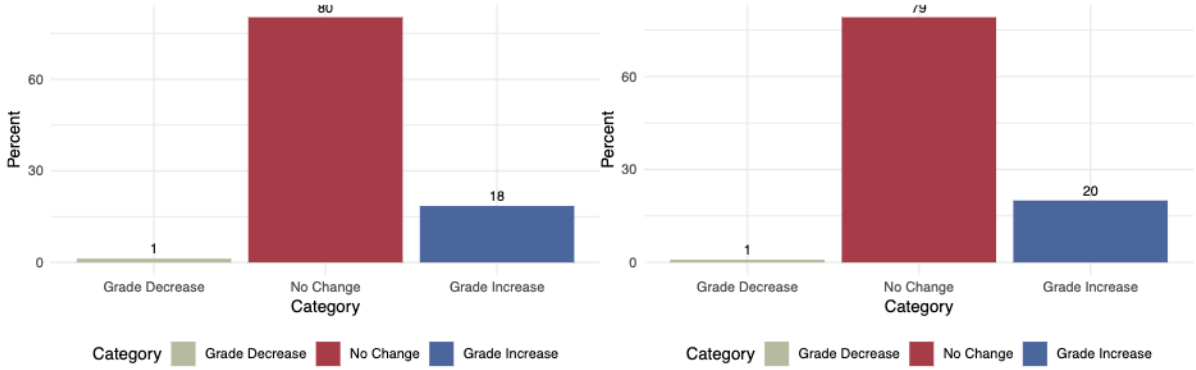
3 Results

Figure 1 explores the percentage of both male and female students who have had their grades unchanged, increased or decreased after requesting a regrade during and at the end of the semester. Figure 1a shows that 80% of male students have received no change in their grades at the end of the semester. Only 18% received a grade increase while 1% of male students received a grade decrease.

Figure 1b shows that 79% of female students received no change in their grades at the end of the semester. However, 20% did receive a grade increase, which is a slight increase compared to male students. 1% of female students received a grade decrease.

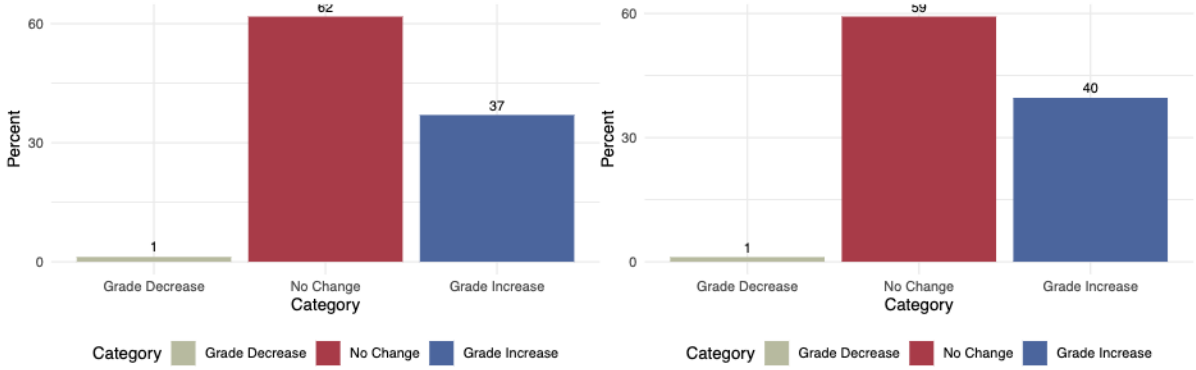
Both Figure 1a and Figure 1b show that most students (male and female) received no change after requesting a regrade at the end of the semester. However, the data shows that female students had a higher percentage by 2% in receiving a grade increase compared to male students. Both male and female students had approximately 1% of regrade requests, resulting in a grade decrease.

Figure 1c and Figure 1d show the change in grades of male and female students who ask for regrades during the semester. In Figure 1c the graph shows that 62% of male students received no change in their grade while 37% received a grade increase and approximately 1% received a grade decrease. Figure 1d shows that 59% of female students received no change in their grade while 40% had a grade increase and approximately 1% had a grade decrease when asking for a regrade during the semester. When comparing the results, 62% of male students received no change after requesting a regrade during the semester – 3% higher than female students. In addition, 40% of female students received an increase in their grade after requesting a regrade – 3% higher than male students. Both male and female students had approximately 1% of regrade requests, resulting in a grade decrease.



(a) End of semester male students

(b) End of semester female students



(c) During semester male students

(d) During semester female students

Figure 1: Regrade Results by Timing and Students' Gender

Figure 2 shows the averaged distribution of the number of classes in which students are considered for regrades by gender. Observable in the graph, there is only data available on students who considered regrades in '0 class' to '5 classes or more' (Figure 2). Therefore, with the number of classes limited to 5, it's more than likely that surveys understate the regraded data (Li and Zafar 2023). Observably, with no or 0 classes, the majority of students didn't consider regrade requests, with females upholding 41.2 % while males upholding 39.3%, making it a

1.9% difference. This trend of females considering for regrades is higher than males when the class number is lower, where at 1 class, 30.4% of females are considered for regrades in contrast to 22.7% of males. This translates to a huge margin of 7.7% between the two genders.

However, as the number of classes extended above 1, or from 2 to 5 or more classes, more males considered asking for a regrade. For instance, at 3 classes, 8.9% of males considered for regrades as opposed to 7.1% of females; at 4 classes, 3.3% of males considered for regrades compared to 2% of females and finally, at 5 classes or more, a great 5.2% of males considered for regrades compared to a small 2.1% females. Statistically then, while the difference is negligible in some categories of the class number, males are more likely to consider and ask for regrades compared to females (except for those with 1 class).

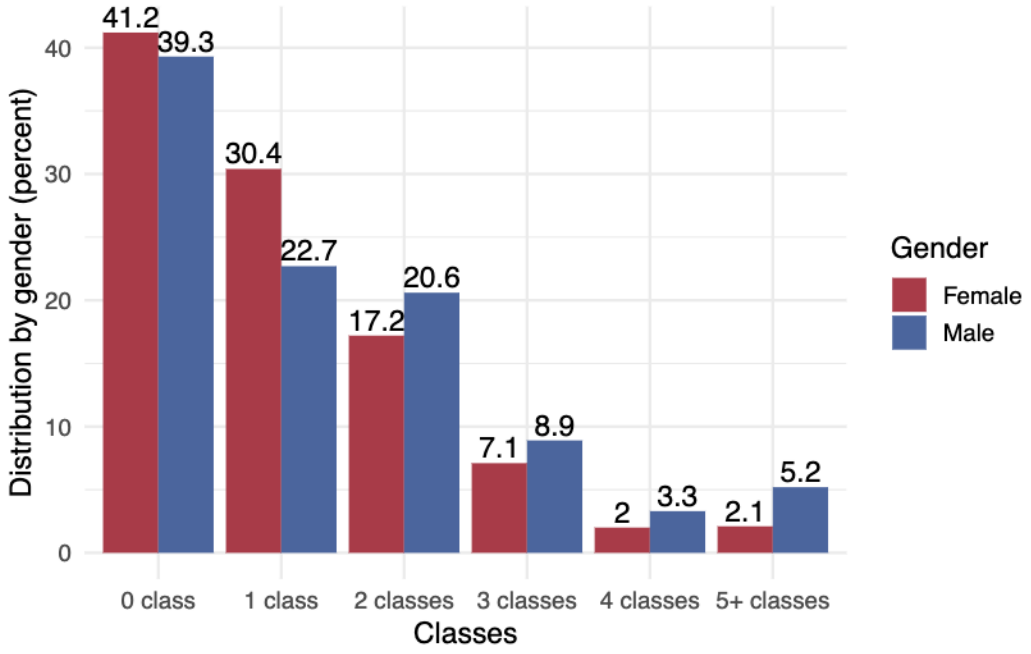


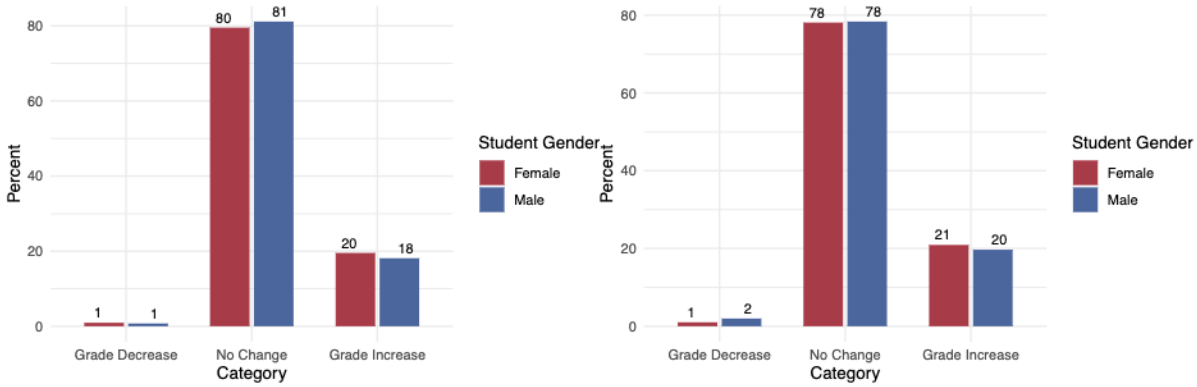
Figure 2: Number of Classes Students Considered for Regrade Requests by Students' Gender

4 Discussion

The original paper looked to analyze the gender differences among undergraduate students upon regrade requests. The main question Li and Zahar analyzed was whether these requests result in favourable outcomes for either gender. To extrapolate on the original findings, we look to understand if the gender differences in regrade requests also correlate with the gender identity of the regrading instructors.

4.1 Male and Female Regrade Outcomes

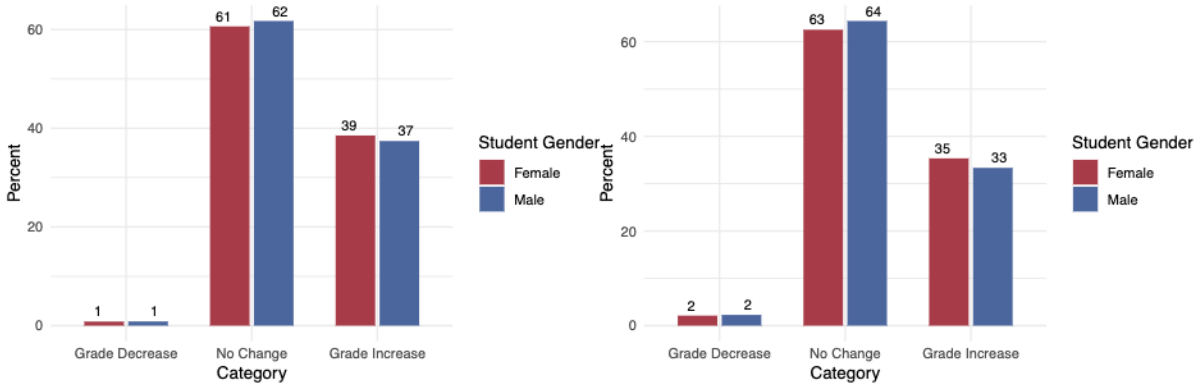
Within Figure 1, one key point to consider is the disparity in outcomes between male and female students when requesting a regrade. The data shows that a higher percentage of male students (62%) received no change in their grade after requesting a regrade during the semester compared to female students (59%). This explains the notion that males typically send out higher requests of regrades compared to their female counterparts. This could be attributed to the social implications placed on each gender, confirming the concept that men are more assertive hence their inclination to ask for regrades. Women are more accepting hence they refrain from attempting to submit a request (Edwards 2023). When looking at the percentage of students who received an increase in their grade after requesting a regrade, it turns out that a higher proportion of female students (40%) experienced this outcome than male students (37%). This suggests that, although male students were less successful overall in achieving grade changes when changes did occur, they were slightly more likely to increase for female students. Statistically, this 3% difference in outcomes, does not explain a great deal regarding the skewed gender implications but further research is required to understand the broader implications.



(a) End of Semester Grades, Male Instructors (b) End of Semester Grades, Female Instructors

Figure 3: End of Semester Regrade Results by Student and Instructor Gender

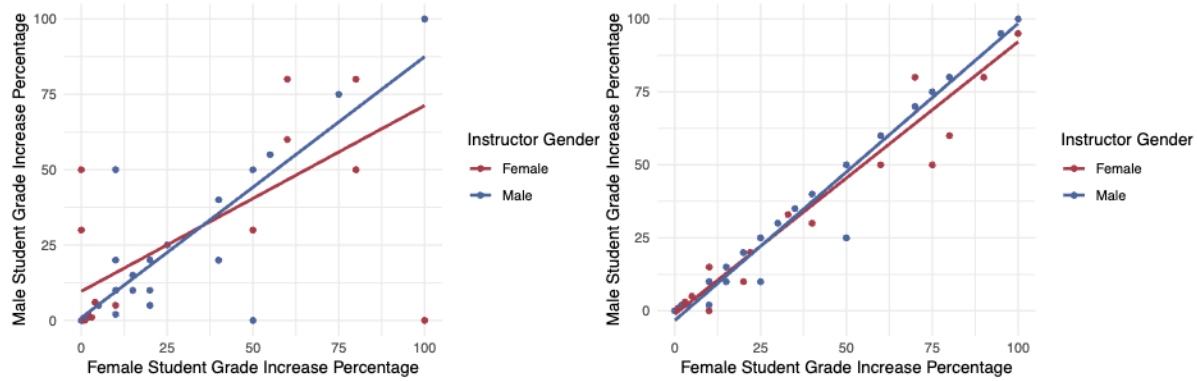
However, there appears to be a different trend, looking at Figure 3 and Figure 4. These graphs provide the average percentage of students' regrade outcomes by the gender of the instructors. In particular, for both male and female instructors, during the semester or at the end of the semester, female students are more likely to receive a grade increase if they do ask for regrades, at respectively 39% and 20% (male instructors) and 35% and 21% (female instructors). When coupled with data on the distribution of grade increase by instructors' gender too, the dataset also reveals a similar trend. From Figure 5, when marked by male instructors, male students are more likely to receive a 0-10% grade increase compared to their female counterparts, whose grades increased by 12.5-25%, observable in the blue clusters in the bottom left of both graphs and how they are more skewed towards the x-axis. As for



(a) During Semester Grades, Male Instructors (b) During Semester Grades, Female Instructors

Figure 4: During Semester Regrade Results by Student and Instructor Gender

regrades during the semester, male and female students give out similarly favourable grade increases due to the similar correlation lines. However, female instructors are slightly more likely to give higher grade increases to female students compared to male students, as observed in the red correlation line being more skewed towards the x-axis. We had assumed that male students would have favourable increases from both male and female instructors. However, with this new insight from analyzing regrades and instructor's gender identity, we see that both female and male instructors give out more grade increases upon regrading to female students compared to male students. This could be attributed to the new social norm to 'lift' up these students to promote a more equal playing field.



(a) Regrade Increase End of Semester (b) Regrade Increase During Semester

Figure 5: Regrade Results by Timing, Students' Gender and Gender of Instructor

Figure 5 also projects that, compared to regrades at the end of the semester, instructors are more likely to provide favorable grade increases for regrades during the semester, as seen in the consistent grade increase of both male and female students in the second scatter-plot. This trend of grade increase during the semester could be attributed to the notion that during

the semester, the grades' weight are less impactful throughout the course thus making grade adjustment easier. Male instructors, in particular, are more likely to give out consistent and substantial grade increases (by 50-100%) to both male and female students compared to female instructors, as observed in the blue clusters on the top right of each graph and how they are closely aligned with the correlation lines. While female instructors do give favorable grade increases, this occurs more often in the 0-50% increase range and more inconsistently, observable in the red clusters in the bottom left of both graphs and how they are more scattered.

4.2 Trends Among Student Gender and Regrade Requests for Different Number of Classes

Another trend from Figure 2 suggests that regrade consideration between male and female students depends on the number of classes that they have. Female students are more inclined to submit regrade requests when taking fewer courses as 30.4% consider a regrade request when taking one course, compared to 22.7% of male students. However, when the course load is higher the trend is reversed. More male students submit or consider regrade requests compared to their female counterparts. At three classes, 8.9% of males consider regrades compared to 7.1% of females, and at five classes or more, 5.2% of males consider regrades compared to only 2.1% of females.

This trend suggests that males are more likely to consider and ask for regrades compared to females in all categories of classes, except for those with 1 class. This translates to the fact that, speculatively, males are more likely to consider for regrades regardless of and in more circumstances than females. This is a factor for consideration, especially taking into account gender expectations regarding assertiveness and social boundaries when it comes to asking for more, and in this context, asking for more grades. Vice versa, females on average are only likely to ask for regrade in one class even if they have more than one class that necessitates regrade consideration. This trend could be attributed to the notion that with 1 course, more investment is required hence the motivation to work harder.Compared to a higher course load which requires time management and balance.

Further analysis could explore potential reasons behind these disparities, such as differences in the types of courses taken by male and female students, variations in grading criteria, or individual attitudes toward requesting grade changes.

4.3 Ethics and Biases

To note, there are further pain points regarding the gendered nature of the dataset, making the analysis reductive. Previous research has remarked on the discrimination against people of sexual minority background in educational settings (LGBTQI+), which poses considerable alarm on how they would be unfavourable when it comes to regrade requests in a college setting (O'Neill et al. 2022). However, the study only assesses regrade requests from a binary

gendered perspective since the participants identified as either males or females. This limits the study's assessment of those who identify as non-binary, two-spirited or gender-fluid. Accordingly, we recognize that simplifying the gender spectrum to a mere binary of males and females can disregard the struggles non-binary people have against college discrimination (or re-grading in this paper's context). Contextually, the original study simulates a classroom setting within a closed laboratory to survey the implications of regrade requests. The study required participants to perform their student identity and imitate their regrade request scenarios, which could have posited the students to have a 'formal", heteronormative identity to fit in with the study's nature, modifying their overall behaviour. It drives students away from a typical scenario of regrade requests, where there is a big power difference between a student and an actual professor.

4.4 Limitations

Since this paper was based on another paper, our analysis was limited to the results and interpretations made by Li and Zahar's original findings. We decided to focus mainly on one aspect of the paper–instructor's gender and favorable regrade requests–rather than exploring the other possible relationships within the data. If we had additional time and resources we would have liked to extrapolate on the other findings within Li and Zahar's paper, regarding positive costs of regrade requests and the personality of students associated with simulating regrade requests in the lab. These additional insights could provide a more comprehensive understanding of the dynamics surrounding regrade requests among college students. By incorporating these findings, we could further clarify the factors influencing students' behaviours and outcomes in academic settings, contributing to a richer and more nuanced analysis of gender disparities within academia.

As mentioned previously, the exclusion of non-binary people could have affected the data collected and impacted the validity. Given their status as an underrepresented group, their perspectives are overlooked, leading to a potential bias in the results. This oversight not only limits the results but the generalization towards a population is skewed. Another limitation was during the replication process the replicated graphs did not produce the identical results as the graphs from the original paper. Instead, the results in the replicated graphs are different from 1-2%. We are not sure why the results are different as the same dataset from the original graph was used to replicate. We assume the cause for this distortion can be attributed to the different logic used in R rather than Stata as used by the original authors.

5 Future

Future studies should aim to investigate the broader implications of gender inequalities in academic settings and how those trends translate into the labour market. Particularly looking at the females and their ability to secure jobs in the same field as their male counterparts.

Understanding these gender biases in the labour force and academics provides valuable insight into how these gender disparities continue to persist. Moreover, studies regarding the long-term consequences of these trends should be conducted to understand the psychological implications. Observing how gender biases affect students' confidence, motivation and overall well-being can help contribute to the understanding of the challenges faced by marginalized groups. Additionally, exploring the intersectionality between factors such as race, ethnicity, socioeconomic status and sexual orientation can provide a holistic understanding of systemic biases and inequity in academia.

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