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ABSTRACT

Greek Life, Academics, and Earnings*

Using records from a large public university, we examine the impact of Greek life on academic performance and salaries. To isolate the causal effect of Greek life, we exploit a university policy prohibiting students from joining a Greek organization during their first semester and a minimum GPA for subsequent eligibility. Regression discontinuity and panel methods reveal that Greek affiliation reduces student grades by 0.1-0.3 standard deviations. Greek effects are largest during the semester of pledging, semesters of increased social activities, and for males. We find no evidence of a Greek salary premium and rule out even modest positive effects.

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Keywords: higher education, fraternity, sorority, greek

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Introduction

Social fraternities and sororities play a central role in the lives of many U.S. college students. According to the 2009 College Senior Survey, 17.5 percent of graduating college seniors report having joined a Greek organization during their college careers (Franke et al. 2010).[1] The national organizations representing fraternities and sororities outline several laudable goals for its membership, including the intellectual development of members, the cultivation of leadership skills, and citizenship through service and philanthropic efforts. Evidence of success on these goals includes the fact that, in 2014 alone, undergraduate fraternity members provided 3.8-million hours of community service and raised $20.3 million for philanthropic causes.[2] Although Greek organizations pursue positive goals, their role in campus life is frequently called into question when there are high profile cases of binge drinking, hazing, and risky behavior that has occasionally resulted in death.[3] While low-frequency catastrophic events like mortality draw national headlines, less is known about the impact of fraternities and sororities on an important dimension of college life, academic performance.

The problematic behaviors sometimes associated with Greek organizations suggest that their effect on student performance could be substantial. For example, DeSimone (2009) finds that Greek members drink more than non-Greeks, even after controlling for prior drinking behavior. An increasing body of evidence demonstrates a causal link between alcohol consumption and reduced academic performance of college students (Carrell, Hoekstra, and West 2011; Lindo, Swensen, and Waddell 2013). Additionally, social events associated with binge drinking (e.g. major college sports games) reduce academic performance (Lindo, Swensen, and Waddell 2012). Countering potential downsides, Greek organizations often incentivize academic performance by awarding their own scholarships and may provide academic support to their members (e.g. tutoring).

Estimating the causal impact of Greek affiliation on academics has proven challenging. While Greek organizations are quick to point out that their members have GPAs above their institution specific averages, this simple statistic does not demonstrate that membership improves academic performance. A key factor driving these differences is that many Greek organizations impose minimum GPA requirements for joining a chapter.[4]

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[1] Throughout the paper, "Greek" refers to members of social fraternities and sororities.

[2] These facts are available for fraternities from the North-American Interfraternity Conference (nicindy.org) and for sororities from the National Panhellenic Conference (https://npcwomen.dynamic.omegafi.com/).

[3] During 2017, pledges died at Pennsylvania State University, Louisiana State University, Florida State University, and Texas State University.

[4] In fact, the North-American Interfraternity Conference (NIC), the governing body for many fraternities in the United States, requires that potential new members with established collegiate GPAs have at least a 2.5 GPA to join. The NIC also requires that each chapter maintain a GPA that is at or above 2.7. If the male

Additionally, previous studies document significant differences in background characteristics between Greeks and non-Greeks. For instance, Sacerdote (2001) finds strong evidence of selection into Greek organizations at Dartmouth based on above average drinking during high school. Greeks also tend to come from more affluent families and are more likely to be white (De Donato and Thomas 2017; Routon and Walker 2014). These observable differences raise the concern that the two groups may also differ in unobservable ways (e.g. ambition, motivation, social skills etc.). Given these systematic differences between Greek and non-Greek students, simple comparisons of academic outcomes for the two groups should not be interpreted as causal.

The existing literature on Greek affiliation's impact on academic performance has attempted to sort out the causal effect but remains conflicted. A pair of studies using a large set of individual characteristics in a propensity score matching framework find negligible negative or even positive effects of Greek affiliation on academics (Routon and Walker 2014; Walker, Martin, and Hussey 2015). In contrast, De Donato and Thomas (2017) use an individual fixed effects approach and find substantial negative effects of Greek affiliation using the same data as Walker, Martin, and Hussey (2015).[5] These conflicting results highlight the importance of addressing unobservable differences between Greek and non-Greek students.

Characteristics of our data and institutional setting allow us to contribute to the existing literature in several ways. The public university we consider is broadly representative of four-year public institutions and supports a large Greek community, making it an ideal setting to estimate the impact of Greek life.[6] The granularity of our data allows us to track a student's Greek status by semester, from unaffiliated, to pledge, to active member, and when applicable, to inactive due to chapter suspension. This allows us to document the impact of Greek life on academics across the Greek life cycle. Over our 10-year sample period, 20 chapter suspensions allow us to estimate the impact of suspension, a common policy used to address behavioral incidents, on students' academic performance for the first time. Finally, our results are supported by two separate identification strategies that exploit university-specific eligibility requirements for joining a Greek organization.

GPA at the institution is below 2.7, the chapter must maintain a GPA that equals or exceeds the male GPA at the institution. The National Panhellenic Conference (NPC) that serves as the governing body for most sororities requires that each chapter meet or exceed the campus all-women's GPA.

[5] Using retrospective survey data and an instrumental variables approach, Mara, Davis, and Schmidt (2018) find that students induced to join fraternities based on university housing policies earn lower grades.

[6] Previous studies have analyzed data from an elite private university (Duke) (Walker, Martin, and Hussey 2015; De Donato and Thomas 2017) and an unnamed formerly all-male private university (Mara, Davis, and Schmidt 2018).

Our first identification strategy is a regression discontinuity (RD) approach that relies on an institutional GPA requirement for joining Greek organizations. The university in our study requires students to attain a cumulative GPA of 2.5 prior to rushing. Our RD research design is motivated by the intuition that students with GPAs just below the 2.5 eligibility threshold entering their second semesters provide a good counterfactual for students who have a GPA just above the threshold. As we will show, students who barely exceed the eligibility requirement are much more likely to join a Greek organization than those who barely fall short. Further, students with GPAs close to the eligibility threshold are very similar in terms of their observable characteristics. This supports the assertion that the subsequent difference in academic performance of students just above and just below the threshold captures a causal impact of Greek membership on academic achievement.

Our second identification strategy builds on the scholarship of De Donato and Thomas (2017) and relies on the longitudinal nature of our data.[7] The university in our study requires students to complete at least one semester as a full-time student prior to rushing a Greek organization, providing a baseline level of academic performance. In our fixed effects models, we identify the impact of Greek affiliation on academic performance by comparing students' post-affiliation performance to their *own* pre-affiliation performance. This approach differences out any unobservable characteristics about the student that are time invariant. Additionally, we control for cumulative college experience to address the possibility that students may systematically improve or shirk as they approach graduation.

Results from both specifications indicate that following affiliation students' grades fall significantly below the level expected based on their prior performance and accumulated experience. The detrimental impact is largest during the semester of pledging and for males. Increased course withdrawals and selection into easier courses during the pledging semester suggest that focusing solely on course grades understates the detrimental impact of affiliation on academics. Following chapter suspensions, the grades of former members rebound closer to their expected levels, suggesting that, while often levied in response to behavioral incidents, suspensions may also improve academics. Speaking to mechanisms, declines in grades for active members are significantly larger in spring semesters, which coincide with additional social events but fewer reported service hours per member.

Despite reductions in academic performance, it is possible that other aspects of Greek life such as the fostering of leadership skills and professional networks could serve graduates well in the labor market. To complement our analysis on academic performance, we use secondary data from a post-graduation survey to estimate the impact of Greek affiliation

[7] De Donato and Thomas (2017) use an individual fixed effects model with data from two cohorts at Duke University. One limitation of their data is that it only provides information on Greek status at one point during a student's academic career.

on starting salaries. While a Greek salary premium is evident in the cross-section, we present evidence that cross-sectional estimates are positively biased. Using the RD approach, we find no evidence of a salary premium for Greek students with marginal academic credentials upon affiliating with a fraternity or sorority, and we rule out modest positive effects.

The rest of the paper is organized as follows. Section 2 describes the university, its Greek life policies, and our transcript-level data. In Section 3, we detail our RD approach and present the associated results. In Section 4, we describe the individual fixed-effects model and present our results of impacts across the Greek life cycle, including the impact of chapter suspensions. Section 5 presents estimates of the impact of Greek life on starting salaries, and Section 6 discusses the implications of our findings.

Background and Data

Our data come from a large public university located in the midwestern United States. Based on the 25th and 75th percentile of ACT scores of incoming students, this university is similar to four-year public institutions such as Indiana University-Bloomington, University of California Santa Barbara, and the University of Vermont. Importantly for our study, the university has a rich Greek heritage and over 38% of the students in our sample affiliate with a Greek organization over their undergraduate careers.

The Greek life cycle at the university is similar to that of many institutions. The vast majority of students (99%) start their college careers during the fall semester. Students are prohibited from affiliating with a fraternity or sorority during their first semester as they adjust to campus life. Students who complete a minimum of 12 credit hours are eligible for Greek recruitment during their second semester.[8] Beginning in the Fall of 2009, the university added the requirement that a student must have a GPA of at least 2.5 to be eligible for recruitment.[9]

Appendix Table A1 outlines the traditional timeline for a Greek student and defines the key terms used throughout the paper. Recruitment (sometimes known as *Rush*) is the process by which Greek organizations introduce themselves to prospective members by hosting a series of open events. After the brief recruitment period lasting approximately one week, existing members vote on whether to extend a bid to prospective members, who in turn decide whether to accept the bid. Matched students become *pledges*, undergoing new

[8] Transfer students are allowed to be part of the Greek recruitment process in the first semester they enroll if they have completed at least 12 hours with at least a 2.5 GPA at their former institutions. If transfer students were members of Greek organizations at their prior institutions, they could affiliate with the same chapters upon transfer and bypass the recruiting process.

[9] While the university had no GPA requirement for pledging prior to 2009, individual organizations were allowed to impose a GPA requirement. We do not have information on chapter specific GPA requirements.

member education that lasts for much of the semester. Anecdotal evidence suggests that pledges are sometimes subjected to hazing and that the "social activities" during the pledge semester may divert attention from a student's studies. Upon successfully completing the new-member education process, pledges are initiated as *active* members. Barring any voluntary or forced disaffiliation (e.g. suspension), students will remain as active members for the remainder of their undergraduate careers.

Our primary data track academic performance at the student-course level from Fall 2007 through Spring 2017. We focus on performance during the traditional fall and spring semesters.[10] Because our identification strategies exploit a university policy prohibiting students from joining a Greek organization during their first semester, we drop students missing first semester records (i.e. those enrolling prior to Fall 2007). Finally, we restrict our analysis to domestic students because the majority of international students are missing ACT scores, and the international students in our sample almost never affiliate. After dropping incomplete records, the resulting sample contains 991,949 student-course observations for 34,159 students.

Table 1 provides summary statistics stratified by gender and Greek status. Unconditionally, both male and female Greeks perform better in the classroom than non-Greek counterparts. This holds whether the comparison is based on raw GPA, or a GPA based on grades normalized by course section.[11]

While the above summary statistics reveal that Greek membership is associated with higher grades, the simple statistics do not imply a causal relationship. The primary empirical challenge to estimating the causal impact of Greek affiliation is that membership is endogenous because there are GPA requirements for admission and students choose to affiliate. As shown in Table 1, relative to non-Greeks, students who affiliate are more likely to be white, less likely to have medium or high financial need, and less likely to be a state resident. Differences in these characteristics are likely to exert bias on estimates that compare the academic performance of Greeks to non-Greeks. Moreover, it is conceivable that there is selection on unobservables (e.g. work ethic, personality traits) that would cause Greek status to be endogenous in a grade regression that controlled for observable characteristics. To overcome the endogeneity in Greek status, we rely on two different identification strategies: regression discontinuity and panel data approaches.

[10] We exclude grades from condensed terms (summer and January terms) because these terms are substantially different in structure, offerings, class size, and teacher and student characteristics.

[11] The normalized grade is calculated as the difference between the student's grade and the average grade for the section of the course divided by the standard deviation of grades in the course. The grade scale is the standard four-point scale with both an A and A+ generating four points, and a failing grade yielding zero points.

Regression Discontinuity Approach

In order to be eligible to rush a Greek organization, a student at the university must have completed at least one semester with a cumulative GPA of at least 2.5. The vast majority of students (88 percent of women and 80 of men) that affiliate during their academic careers pledge during the spring semester of their first year. Thus, we focus on cumulative GPA entering a student's second semester as the key eligibility criteria.[12] For this RD specification, we restrict the sample to students enrolling in Fall 2009 and beyond, which is the time frame in which the university GPA requirement was in effect.

To identify a plausible comparison group for Greeks, we take advantage of the fact that eligibility to join a Greek organization is suddenly activated with a first-semester GPA of 2.5. Students with GPAs just above 2.5 are free to affiliate, while students with GPAs just below 2.5 are not. Thus, the marginally eligible students are much more likely to join a Greek organization. However, the two groups are otherwise quite similar in their academic performance through their first college semester and, as we will show, similar in their observable characteristics. Comparing subsequent academic outcomes of the marginally eligible to the marginally ineligible provides an unbiased estimate of the impact of Greek affiliation for students with qualifying GPAs near the threshold.

The first empirical question is whether the university's eligibility policy binds. Does attaining a first-semester GPA of 2.5 lead to a discontinuity in the probability of affiliating with a Greek organization? Figure 1 illustrates the discontinuity in second semester affiliation. It shows the probability of affiliating during second semester (the outcome) on the vertical access and the number of GPA points above or below the 2.5 GPA threshold (the running variable) on the horizontal access. Each dot represents the share of students within that GPA category who affiliate. Each GPA category has a width of .05 GPA points. For instance, the dot just to the right of the cutoff represents the percentage of all students with a GPA between 2.5 and 2.549 who pledge during second semester. All subsequent RD figures take the same form.

Visually, it is apparent that being just above the eligibility threshold leads to a significant increase in the probability of pledging during second semester.[13] The discontinuity in second-semester affiliation is approximately 20 percentage points. If other factors that

[12] The university introduced a winter session in January 2014. If students enroll in the winter term after their fall semester, the GPA at the end of the winter term is used as the qualifying GPA. For ease of exposition, students' GPA at the end of their first winter term is referred to as the first-semester GPA.

[13] There are a few students without qualifying GPAs (those to the left of the threshold) who nonetheless appear to affiliate. These students may be transfer students who are eligible to affiliate based on GPAs at their original institutions or could reflect measurement error in the university records.

might influence GPA do not change discretely at the 2.5 threshold, any discrete change in subsequent academic performance can plausibly be attributed to Greek affiliation.

To estimate the magnitude of the discrete jump in Greek affiliation and any corresponding discontinuity in subsequent academic performance, we estimate the following RD model:

$$(1)\ Grade_{ijt} = \beta_0 + \beta_1 Eligible_i + f(CenterCumGPA_i) + f(CenterCumGPA_i) * Eligible_i + \theta_t + \varepsilon_{ijt}$$

where $Grade_{ijt}$ is the normalized course grade for student i in course j in semester t.[14] $Eligible_i$ is an indicator equal to one if student i attained a first-semester cumulative GPA of at least 2.5. Further, θ_t is a fixed effect for each academic semester in our sample. The running variable is $CenterCumGPA_i$, which is the student's first-semester GPA centered at the 2.5 eligibility threshold. For example, a cumulative GPA of 2.25 would have a value of $CenterCumGPA_i$ of -0.25 (.25 GPA points below the eligibility threshold). The coefficient of interest, β_1, is the effect of being eligible to affiliate with a Greek organization during second semester on course grades.[15]

Following Imbens and Lemieux (2008), we estimate the discontinuity using local linear regression and uniform kernel weights.[16] Our preferred specification uses a bandwidth of 0.4 GPA points, but we also present estimates using bandwidths of 0.3 and 0.5 GPA points.[17] Since our running variable of cumulative GPA entering second semester is discrete (measured to the nearest hundredth), we cluster the standard errors at the GPA level as recommended by Lee and Card (2008).

Evidence of the Validity of the RD Design

Nonrandom sorting is the central threat to any RD design in which individuals who could be affected by the policy may know the cutoff. In our setting, strategic sorting could

[14] Normalized course grades are the deviation of the student's grade from the course-section-semester mean divided by the course-section-semester standard deviation.

[15] Our approach most closely follows the regression discontinuity approach employed by Lindo, Sanders, and Oreopoulos (2010), which uses a GPA cutoff for academic probation to estimate the impact of probation on subsequent academic performance.

[16] Imbens and Lemieux (2008) argue that differences in estimates when using more complex weighting schemes are primarily indicative of sensitivity to bandwidth choice.

[17] The mean-square error optimal bandwidth selection procedure proposed by Calonico, Cattaneo, and Titiunik (2014) suggests a bandwidth of between 0.29 and 0.46 depending on the specification. We do not present any bandwidths larger than 0.5 GPA points because they would include the discontinuity in probationary status (2.0 threshold at the university). Lindo, Sanders, and Oreopoulos (2010) find that academic probation improves the academic performance of students who remain in college.

occur if students otherwise just below the eligibility cutoff were actively influencing their GPAs to become eligible. This could take the form of students lobbying teachers to award them higher grades or students exerting precisely enough effort to achieve cumulative GPAs of 2.5.

By focusing on eligibility status entering semester two, we decrease the likelihood of strategic manipulation. Students in their first semester may be unaware of university policies and are less familiar with college grading standards than more experienced students. According to university statistics, from 2013-2017, over 900 students who were academically ineligible registered for Greek recruitment, suggesting that they were unaware of the requirement or overly optimistic about their GPAs. Further, it would be difficult for students to hit specific cumulative GPAs because incoming students must complete at least 12 credit hours to become Greek eligible, and so their cumulative GPAs represent grades across several courses taken concurrently (12 credit hours corresponds to four typical three-hour courses).

As noted by McCrary (2008), if subjects were able to manipulate the outcome to just meet the eligibility requirement, we would expect a disproportionate number of students to have cumulative GPAs falling just above the 2.5 threshold. Figure 2 shows the distribution of observations around the 2.5-GPA threshold. Visually, the distribution is quite smooth across the threshold, consistent with no manipulation.[18] Estimating equation (1) using the number of observations at each GPA level as the dependent variable yields a statistically insignificant discontinuity of 5.6 (p-value of 0.54).

The validity of the RD design also hinges on the assumption that additional characteristics related to academic performance other than Greek affiliation vary continuously at the cutoff.[19] To further probe this assumption, Table 2 reports the extent to which several observable variables that could plausibly affect academic outcomes are continuous across the cutoff. The variables examined include a measure of academic aptitude (ACT score) and several demographic characteristics: minority status, age at university entry, state resident status, and financial need. Finally, because one way to manipulate first-semester GPA is by strategically withdrawing from challenging courses, we consider an

[18] We present Figure 2 using bins of 0.1 GPA points rather than .05 GPA points to address mechanical heaping that occurs at increments of 0.1 GPA points. For example, more students will have a first semester GPA of 2.70 than 2.71, because more combinations of course GPAs average to an even tenth. Bins of 0.1 include one "heaped" GPA in each bin. Figure 2 demonstrates that after accounting for this mechanical heaping, the distribution of observations is smooth around the threshold. See Barreca, Lindo, and Waddell (2016) for a further discussion of heaping in RD settings.

[19] The primary concern is not that observable characteristics are smooth across the threshold, as we can control for observables directly. However, discontinuities in observable characteristics may suggest that there are also discontinuities in unobservable determinants of academic performance.

indicator for withdrawing from any first-semester course. We do not find statistically significant (at the .10 level) discontinuities in any of these variables. Further, the magnitude of the point estimates are negligible, suggesting that individuals on either side of the cutoff are similar, which supports the validity of the RD design.

Academic Performance Results

If Greek affiliation affects academic performance, one should observe a discontinuity in academic outcomes at the eligibility threshold analogous to the discontinuity in Greek affiliation. Figure 3 shows the discontinuity in normalized course grades for all coursework following first semester (hereafter referred to as subsequent grades). There is a visual drop in academic performance at the eligibility threshold, suggesting that Greek affiliation hinders classroom performance.

Table 3 shows the associated regression estimates corresponding to Equation (1). Panel A provides estimates of the discontinuity in the probability of affiliating with a Greek organization, while Panel B estimates the associated discontinuity in subsequent grades. Across a variety of bandwidths, being just eligible to join a Greek organization causes a reduction in course grades of 0.05 to 0.07 standard deviations. Consistent with the identifying assumption that other determinants of academic performance vary smoothly around the eligibility threshold, the inclusion of additional controls (Column 2 and beyond) leave estimates largely unchanged.[20]

To calculate the impact of Greek affiliation on academic performance, the discontinuity in subsequent grades (Panel B) must be reweighted by the discontinuity in pledge probability (Panel A). We do this using two-stage least squares, as described by Hahn, Todd, and Van der Klaauw (2001). Since the first-stage discontinuity always has a first-stage F-statistic of over 100, we need not be concerned about weak instruments. The corresponding estimates of the impact of Greek affiliation are shown in Panel C and imply that Greek affiliation reduces GPA in subsequent coursework by 0.2 to 0.3 standard deviations. Appendix Figure A1 demonstrates that these estimates are fairly stable across bandwidths.

To provide some perspective on the size of these effects, Carrell and West (2010) find that college students assigned to a professor whose quality is one standard deviation below average perform worse by about 0.1 standard deviations. In the realm of peer effects, Carrell, Fullerton, and West (2009) find that being randomly assigned to a peer group with SAT verbal scores one standard deviation above the mean increases course grades by about 0.08

[20] Estimates are robust to the use of quadratic trends in first-semester GPA and alternative samples (see Appendix Table A2).

standard deviations. In short, the decline in academic performance associated with Greek affiliation is substantial.

A common narrative about Greek organizations is that they provide a sense of community to members, which in turn may increase student retention. Figure 4 tests this hypothesis by employing the analogous RD strategy using retention to sophomore year as the outcome. The visual evidence suggests that if anything, retention declines. The associated point estimate for our preferred specification implies a 0.4 percentage point decline in retention.[21] With a 95% confidence interval spanning -4 to 3 percentage points, being eligible to join a Greek organization has little effect on retention.

These estimates represent a local average treatment effect: the impact of joining a Greek organization during second semester of freshmen year on subsequent grades for students who marginally exceeded the eligibility threshold. These marginal pledges may experience a different treatment effect from the overall Greek student body. Indeed, in the next section, using the fixed effects model, we demonstrate that affiliating students with grades within 0.3 points of the eligibility cutoff experience larger declines in subsequent performance. Speaking to the generalizability of these estimates, a GPA requirement of 2.5 is quite common nationally.[22] Any policy change that adjusts this eligibility threshold, for instance by increasing its stringency, would impact these marginal pledges. To increase the precision of our estimates and to investigate how the effects of affiliation vary over the Greek life cycle and across students, we turn to an individual fixed effects model.

Individual Fixed Effects Approach

While the RD analysis provides compelling evidence that Greek affiliation has a causal negative effect on academic performance, the RD design is limiting in several ways. As we describe below, exploiting the panel feature of data to correct for the endogeneity of Greek affiliation allows for a more in-depth analysis of how Greek affiliation affects academic performance over the life-cycle of the student. The fixed effects regression specification we use for the analysis is specified as:

$$(2)\ Grade_{ijt} = Greek_{it}\beta + X_{it}\gamma + \alpha_i + \theta_t + \mu_{ijt}$$

where $Grade_{ijt}$ is the normalized course grade for student i in course j in semester t. $Greek_{it}$ is a dummy variable that indicates whether student i in semester t is currently pledging or

[21] Our preferred specification is local linear regression with a bandwidth of 0.4 GPA points and controls.

[22] The NIC, which is the governing body for many fraternities in the United States, requires that a potential new member who has established a collegiate GPA have at least a 2.5 GPA to join. Some institutions allow incoming students to affiliate during their first semester, prior to establishing a collegiate GPA.

has previously joined a Greek organization. Individual fixed effects, α_i, control for unobserved time-invariant characteristics that potentially affect course grades, such as innate ability. The θ_t represent academic semester fixed effects, and X_{it} is a vector of controls for individual characteristics that vary over semesters. Our preferred specification includes experience controls, fixed effects for the number of semesters since students' initial enrollment, to address the possibility that students may systematically improve or weaken as they approach graduation. Standard errors are clustered at the individual level.

In the fixed effects model, the identification of the Greek effect on grades relies on the fact that students are not allowed to be part of the Greek system in their first semester of enrollment. In the second semester, students who complete 12 credit hours and meet the necessary 2.5 GPA requirement may choose to rush and pledge. If there is a Greek effect on grades, we should see the grade-experience profiles of Greek and non-Greek students begin to diverge at the second semester.

Figure 5 compares the GPA profile of students who affiliate with Greek organizations at some point during their time at the university ("ever-Greeks") with two comparison groups: (i) the full sample of students who never affiliate with Greek organizations ("never-Greeks"); and (ii) the never-Greeks who would have been eligible to affiliate with a Greek organization during their second semester. Notably, the average GPA for the full sample of never-Greeks starts much lower than ever-Greeks and exhibits a consistently positive trend. In contrast, eligible non-Greeks (i.e. those with at least a 2.5 GPA at the end of their first semester) have a very similar initial GPA to ever-Greeks and experience a second semester decline in GPA that is similar though smaller to that seen among ever-Greeks.

While we present estimates relative to both comparison groups, our preferred specification limits the sample to only students eligible to affiliate at the end of their first semester. The eligible never-Greeks form a more analogous comparison group because they have the same opportunity to affiliate and they exhibit a more similar distribution of initial grades. Further, differential drop-out rates are likely to overstate the academic improvement of the full sample of never-Greeks. Students who start with low initial grades and do not improve may be subject to academic suspension and even dismissal. Because the threshold for academic probation (and eventually academic suspension) at the university is 2.0, students in danger of academic suspension following first semester are only present in the full-sample comparison group. Focusing on Greek-eligible students mitigates the concern that compositional changes between the Greek and comparison group are driving results.

Fixed Effects Results

In Table 4 we present our main results, which exploit within-student variation in Greek status. In Column 1, we show the estimated effect based on a regression of a student's

normalized course grade on an indicator for Greek affiliation. The indicator is equal to one during the semester of affiliation and in each subsequent semester. To address the possibility that students may systematically improve or weaken as they progress towards degree completion, we control for experience using semester-of-experience fixed effects. Using the full sample of students, we find that sorority members perform 0.14 standard deviations worse and fraternity members perform 0.18 standard deviations worse, relative to what we would expect based on their prior performance and accumulated experience.

Because we are concerned that students with negative grade experience profiles are underrepresented in the full sample of non-Greek students, we anticipate that this approach will overstate the negative effect of Greek affiliation. Column 2 presents results using a restricted sample consisting only of students eligible to pledge during their second semester. This preferred specification indicates that joining a sorority reduces subsequent academic performance by 0.09 standard deviations. Fraternity membership is more detrimental, with subsequent academic performance falling by roughly 0.12 standard deviations.

Our fixed effects estimates are smaller in magnitude but much more precisely estimated than our initial regression discontinuity estimates. Differences in coefficient estimates partially stem from measuring effects for different groups. The RD approach measures the impact of Greek affiliation for students with qualifying GPAs near 2.5, whereas the fixed effects model measures the average impact of Greek statuses for all eligible students.

To make our analysis more comparable, in Column 3 we present estimates from the individual fixed effects model that focus on the subpopulation of students with qualifying GPAs at or slightly above the eligibility threshold (2.5 to 2.8). For both males and females, the estimates increase in magnitude substantially relative to that for the full sample of eligible students. Students with the lowest qualifying GPAs experience a larger relative decline in their academic performance. These estimates are more similar to those found using the RD approach and highlight important heterogeneity in the impact of affiliation. Greek affiliation is most detrimental to those who exhibit lower initial academic aptitude, a finding we probe further in the section on heterogeneous results.

One potential concern with the above estimates is that they rely on the identifying assumption that, absent Greek affiliation, the experience profiles of Greek and non-Greek students would be identical. This assumption would be problematic if those who wish to affiliate increase their effort level in the first semester to improve the odds of being eligible and, after meeting the 2.5 GPA requirement, they revert to their normal level of effort and have their grades fall back to or below the 2.5 GPA. If such behavior occurs, our identifying assumption would be violated and the estimated effect of affiliation would be biased downward. For the moment, we proceed as if the assumption is not violated, but we will return to this point later with several pieces of supporting evidence.

Greek Life Cycle Effects

One strength of our administrative data relative to that used in previous studies is that it tracks students' Greek status by semester. This allows us to document the impact of Greek life on academics across the Greek life cycle: from unaffiliated, to pledge, to active member, and when applicable, to inactive member. To examine heterogeneous effects across the Greek life cycle, we replace the single Greek indicator used in Table 4 with six mutually exclusive indicators for detailed Greek status. The omitted category remains unaffiliated.

Figure 6 presents life cycle results, visually displaying the coefficient estimates. Our preferred specification restricts the sample to only those students eligible to affiliate entering second semester, and our discussion will focus on these estimates. For completeness, Appendix Table A3 shows results for each subsample used in Table 4.

A Greek student's first semester of affiliation involves participating in recruitment and pledging a specific chapter. The semester of pledging is often believed to be the most time intensive because new members participate in their chapter's educational program, which involves learning organization history and traditions, and get to know existing members. The pledging process is also the aspect of Greek life most commonly associated with hazing.

We find that pledging a sorority reduces academic performance by 0.13 standard deviations, while pledging a fraternity reduces performance by 0.20 standard deviations. The effect of being an active member is substantially smaller, reducing grades by 0.08 and 0.09 standard deviations for sorority and fraternity members, respectively.

While the majority of Greek students only experience pledge and active status, sanctions and disaffiliation do occasionally occur. Chapters found to be in violation of university or national organization policies may be suspended, especially if offenses are egregious or repeated. When a chapter is suspended, it is no longer recognized by the university and may not host any sanctioned events, whether social or service-oriented. During our sample period, five percent of sorority members and 12 percent of fraternity members experienced a chapter suspension.

To estimate the impact of suspensions, we include two indicators. The first corresponds to the semester in which the suspension occurs, whereas the second corresponds to all subsequent semesters during which the chapter remains suspended.[23] We distinguish between the two because in the case of a mid-semester suspension, students would have been active members for the early part of the semester.

[23] Suspensions often continue until the last current member has graduated or forbid any suspended members from participating in the re-organized group after recolonization.

For females, mid-semester suspensions are associated with a larger decline in academic performance relative to being an active member. This could be due to either reductions in academic performance associated with the detrimental behavior that resulted in suspension or due to the disruption created by the suspension. However, in subsequent semesters of the suspension, the academic performance of former members partially recovers towards pre-affiliation levels. That is, suspension eliminates some of the negative effect of Greek affiliation on grades for women.

For fraternity members, both mid-semester suspensions and ongoing suspensions are associated with smaller reductions in performance than those seen in active members. Continuing negative effects for former members could be due to permanent changes in behavior. For instance, Carrell, Fullerton, and West (2009) find that peer effects on academic performance from randomly assigned squadrons of freshman at the Air Force Academy persist at a diminished rate in subsequent years of college.[24] Moreover, it's highly likely that members of a suspended fraternity or sorority continue living and socializing with many of their former brothers/sisters and some of the behavior that was detrimental to their academic performance may persist.

Finally, individual students may depart a Greek organization either voluntarily or because the chapter or national organization dismisses them. Unfortunately, our data does not differentiate between voluntary and forced individual departures, prohibiting any strong conclusions. For completeness, we include an indicator for the semester a student departed the chapter and a separate indicator for all subsequent semesters post-departure. In general, former sorority members perform closer to their expected levels following a departure, whereas males who depart a fraternity perform significantly worse.

To provide more insights into how Greek affiliation impacts academic performance, Table 5 estimates the effect of Greek affiliation on grade distribution, course load, and course difficulty. From Column 1 to Column 6, we use a linear probability model to separately estimate the probability of achieving a specific grade (A through F and withdrawals). To make this analysis more comparable with Table 4, which addresses selection into more or less-challenging courses by normalizing course grades within a section, we include subject-

[24] In our setting, one potential channel for persistent declines in academic performance is alcohol use. Previous studies find that Greek affiliation causes increased alcohol consumption (DeSimone 2007, 2009) and that excessive alcohol consumption in college can establish a pattern of overuse that extends later in life (Borsari and Carey 2001).

by-level fixed effects to control for course difficulty.[25] The remaining controls are the same as those used in Table 4.[26]

Panel A reveals that the decline in academic performance due to pledging a sorority is driven by a shift toward the lower end of the grade distribution. The probability of receiving an A falls by over 5 percentage points, while the probability of earning a B, C, or D, all increase significantly. A similar but smaller shift occurs during active semesters. Panel B shows the analogous results for males. Consistent with the main results, Greek affiliation leads to a larger decline in performance for males, and the pledging semester is especially detrimental.

Students may take steps to mitigate the impact of Greek life on their GPA. If so, focusing solely on grades may understate the effect of Greek affiliation on academics. Column 6 reveals that pledges of both genders are more likely to withdraw from courses. For males, the increase in the withdrawal rate is 1.9 percentage points on a mean withdrawal rate of just 2.8 percentage points, representing a 68 percent increase.

Column 7 estimates the impact of affiliation on completed credit-hours within a semester, which takes into account both changes in course registration and changes in course completion. This analysis is analogous to the preceding columns, except that it is conducted at the student-semester level and thus omits course-level controls. Pledges and active members of both genders complete significantly fewer credit-hours in a semester.

Finally, we examine the extent to which Greeks may strategically sort into courses. The dependent variable in Column 8 is the mean GPA earned by students in the specific course section. Pledges of both genders enroll in courses that award higher average GPAs, suggesting they select into easier coursework.

Collectively, these results suggest that Greek affiliation impacts academics beyond a direct effect on course grades. It increases the probability of withdrawing from courses, reduces credits earned during the semester, and leads to enrollment in easier courses. Analysis that focuses solely on course grades would understate the cumulative impact of Greek affiliation on academics.

Heterogeneous Effects of Greek Affiliation

In Table 6, we examine whether there are heterogeneous impacts of Greek affiliation on academic performance. In order to directly test for different impacts by subgroup, Columns 1-4 each include an individual characteristic interacted with the six Greek status

[25] Subject-by-level fixed effects are fixed effects for different subjects and class levels. For example, subjects represent English, mathematics, economics, etc. Levels represent either 100-, 200-, 300-, or 400- class levels.

[26] Columns 1-6 of Table 6 contain more observations than the preferred specification in Table 5 because Table 6 also includes course withdrawals as a possible outcome.

variables. For brevity we report only the heterogeneous impacts of the two primary Greek statuses: *pledge* and *active*. This specification effectively compares the change in performance for each treatment group before and after affiliation to the change in performance of the analogous comparison group over the same time frame (in terms of semesters of experience).

In Column 1, we test for heterogeneous impacts based on academic preparedness proxied by an indicator for an ACT score below the sample median. We find evidence that pledging is even more detrimental to students who were initially less intellectually prepared for college coursework. For active members the results are less clear, with less prepared fraternity members experiencing larger decreases in performance but less prepared sorority members experiencing smaller academic declines.

Affiliating with and remaining in a Greek organization can be expensive, with current dues averaging near $500 per semester. It is conceivable that individuals with more limited financial resources may need to engage in additional work to pay for membership. Active members with medium or high levels of financial need at the time of enrollment experience substantially larger declines in academic performance.

Columns 3 and 4 examine the impact of Greek affiliation at different points in a chapter's life cycle. Colonizing a new chapter may come with an increased time cost for new members, as bylaws are established and recurring events are organized for the first time. Conversely, individuals who initiate a new organization may be less apt to allow that organization to interfere with their studies. Column 3 includes an interaction with an indicator for the chapter having been established or recolonized within the past two years. We find no substantial differences between the effects of new and more established Greek organizations.

Chapters are more likely to be suspended for a given infraction if the infraction is part of a consistent pattern of problematic behavior. If the problematic behavior hinders academic performance, it follows that chapters soon-to-be suspended may exert an even larger detrimental impact on their membership. In Column 4, we directly test this hypothesis by interacting Greek status with an indicator for chapter suspension within the next two years. While there is no additional pre-suspension effect for sororities, the pre-suspension period for fraternities is significantly more detrimental for pledges. Considering the point estimates, being a pledge in a soon to be suspended fraternity causes a decline in academic performance that is over 30 percent larger than that experienced by members of other chapters.

It is natural to wonder whether the decline in academic performance experienced by Greek members can be mitigated. For instance, does the composition of students within a chapter or the presence of Greek siblings in a course impact academic performance? We explore these questions by extending our fixed effects analysis to incorporate information

about a given student's Greek siblings. [27] In addition to an indicator for Greek affiliation, we include controls for the number of siblings from the chapter in a given course and the number of siblings from the chapter who have the same major. To ensure results are due to composition of the chapter and are not simply mechanical impacts of size, we include controls for chapter size and enrollment in each course.

Table 7 presents our results for chapter composition effects. For both genders, having additional Greek chapter siblings in a course is associated with improved performance. While we can only speculate as to the mechanism, this improvement could operate through ease of access to study partners. Many chapters require dedicated study hours and having direct access to classmates may improve the efficacy of study time. Surprisingly, we find that having additional Greek siblings who share a student's major has no impact on the subject's grades.

Evidence on Identifying Assumptions

As noted earlier, an important identifying assumption for the fixed effects result is that absent Greek affiliation, the grade-experience profiles of Greek and non-Greek students would be identical. This assumption would be violated if, in anticipation of trying to join a Greek organization, students exert more than their baseline efforts during their first semester to achieve eligibility, and lower grades post affiliation are simply due to the removal of this eligibility incentive. While it is not possible to entirely rule out this alternative interpretation, we provide multiple pieces of evidence against this being the only explanation.

First, incentives to achieve an eligible GPA largely remain in effect post-membership. Individual chapters will typically place members on probation if their GPA falls below the qualifying GPA.[28] If grades do not improve during the subsequent semester, individuals can be removed from the chapter. Additionally, each chapter must maintain a collective semester GPA of at least 2.5 or face university suspension. These policies suggest established and ongoing student incentives.

Second, students with GPAs far above the eligibility threshold are in no danger of being academically ineligible. Prior results shown in Table 4 reveal that students with qualifying GPAs of 2.8 and above also experience substantial declines in performance following affiliation. To the extent that this group of students face little eligibility incentive during first semester, they provide strong evidence that the effect is indeed due to Greek membership, not incentives associated with eligibility requirements.

[27] Two students are defined as Greek siblings if they are members of the same chapter.

[28] Enforcement is up to individual chapters rather than the university.

Finally, Figure 7 highlights two sources of variation in academic performance that are inconsistent with a first-semester incentive story. The figure shows normalized grade profiles stratified by gender and Greek status. If the sole explanation for a decline in academic performance upon joining a Greek organization is the removal of the incentive to become eligible, we would expect grades between Greeks and non-Greeks to diverge upon affiliation, with non-Greeks performing better by a *consistent* margin. There is no variation in eligibility incentives once affiliated. However, the gaps in normalized grades are inconsistent and vary predictably with the intensity of Greek life. Visually, the largest gap in performance occurs during second semester, when the majority of ever-Greek students pledge.

Figure 7 also highlights a seesaw pattern in the relative grades of Greeks and non-Greeks. Grades are most similar during semesters that traditionally occur during the fall, with much larger gaps occurring during spring semesters.[29] The seesaw pattern mimics the typical schedule of social activities for a Greek chapter, which is unbalanced across semesters because recruitment and the pledging process tend to occur in the spring. For active members, recruitment involves hosting open activities for prospective pledges followed by the process of deciding on bids. After bids are awarded, active members are responsible for new member education, a process that often culminates in additional social activities following initiation. University records indicate that during the last six years of our sample (the farthest back that such records exist), there were 24% more registered social events with alcohol during spring semesters relative to fall semesters. While social activities are more time consuming for Greeks in the spring semester, the opposite is true for time spent in community service. The data available for the last 4 years of our sample shows that hours of community service per member is 16% lower (about 0.5 hours) in the spring than the fall semester. Broadly speaking, as the intensity of social activities associated with Greek life increases, so does the detrimental impact on academics.

Labor Market Outcomes

A central goal for many college students is to attain a desirable and high-paying job upon graduation. To the extent that joining a Greek organization alters the typical college experience, Greek membership could impact job prospects. Our initial finding that Greek

[29] For students initially enrolling during the fall, as is typical, fall semesters correspond to even numbered semesters of experience starting at 0; spring semesters correspond to odd values of experience. Returning to Table 6 on heterogeneous effects, Column 5 includes an indicator for spring semester and an interaction between spring and active to test for differential effects across semesters. For sororities, membership during fall semesters reduces academic performance by about 0.05 standard deviations, but in the spring it does so by over 0.1 standard deviations. For fraternity members, the contrast is similar but less drastic.

affiliation reduces classroom performance suggests that Greek members may experience worse labor market outcomes than they otherwise would. However, reductions in formal academic achievement may be more than offset by other aspects of the Greek experience. Advocates of Greek life suggest that membership improves leadership and social skills, and provides access to professional networks that could serve to improve the labor market outcomes of Greek graduates.

In this section, we estimate the impact of Greek affiliation on the starting salary of recent graduates using data from a university issued post-graduation survey administered to students graduating between the 2012/13 and 2016/17 academic years. Graduates were contacted during the fall following their graduation and were asked a series of questions regarding their then-current employment status. The survey response rate for the salary question was approximately 43% among graduates not enrolled in continuing education. Each response corresponds to a $10,000 salary range, with top-coding at an initial salary of over $90,000. To facilitate analysis, we recoded each range at its midpoint (e.g $60,000 - $69,999.99 becomes $65,000).[30]

Table 8 presents our estimates of the impact of Greek affiliation on starting salary. In Column 1, we present OLS estimates using the full sample of students reporting salary information. Students who affiliate with a Greek organization during second semester report salaries that are roughly 15% higher, after controlling for observable heterogeneity in pre-collegiate backgrounds. This finding is similar to other cross-sectional estimates of the Greek salary premium.[31] However, these premiums may not reflect a causal effect as those who join Greek organizations may be more inherently social or skilled, or have a family background that enhances earnings potential. Our data has no information about such attributes. Higher starting salaries among such graduates may simply reflect a return to unobserved characteristics or to preferences that are correlated with a student's decision to both join a Greek organization and pursue a high-paying job.

We probe for the presence of omitted variable bias related to unobservable student preferences by including a control for each student's entering academic division in Column 2. Since students' initial academic divisions are determined before their first semester, they cannot be influenced by Greek affiliation. Entering academic division provides insights on intended career path and may be correlated with future salary. The inclusion of this coarse measure of pre-existing preferences reduces the estimated Greek salary premium by over 25 percent. Greek members are disproportionally drawn from students entering academic

[30] For the lowest salary category of $0 to $20,000, we use $14,500 as the mid-point as it represents full-time pay at the federal minimum wage.

[31] Analyzing data from Dartmouth University, Marmaros and Sacerdote (2002) find a cross-sectional wage premium of $6,066 on a mean salary of $40,177, a 15% salary premium. Likewise, Mara, Davis, and Schmidt (2018) find a salary premium of about 20% for fraternity members.

divisions with high starting salaries on average. This exercise suggests that important unobserved differences likely exist between Greeks and non-Greeks that positively bias cross-sectional estimates.

The survey data contain salaries for both part-time and full-time workers, but do not include information on hours worked. To address the possibility that some of the Greek wage premium is driven by differences in working hours or pursuit of further education, we restrict the sample to full-time workers (Column 3). The salary premium persists, albeit at a diminished nine percent. In Column 4, we further restrict the sample to those individuals who would be present in regression discontinuity analysis, including those with GPAs closest to the 2.5 eligibility threshold. While the precision of the estimated Greek wage premium is reduced with the smaller sample, the point estimate of the wage premium is virtually identical to that for the entire sample.

Our initial analysis suggests that traditional cross-sectional estimates of the Greek salary premium are positively biased. To estimate a causal impact of Greek affiliation on early career salary, we use the regression discontinuity approach described in Section 3 (Figure 8). There is no stark increase in salary at the threshold in our data; if anything, salaries appear to be a bit lower.

In Appendix Figure A2, we document RD estimates of the effect of Greek affiliation on starting salaries across a variety of bandwidths. The coefficient estimates are noisy but uniformly negative, suggesting that the marginal Greek student may suffer a salary penalty. While none of the salary estimates are statistically significant at the .10 level, we are able to rule out relatively modest salary premiums. Using the boundaries of the 90% confidence intervals, a 10% salary premium can be ruled out in 14 of the 21 estimates using different bandwidths, and a 15% premium can be ruled out using 19 of the 21 bandwidths. While imprecise, this analysis is consistent with the narrative that a Greek wage premium is largely a product of positive omitted variable bias in the cross-section. Little if any salary premium represents the causal impact of Greek affiliation.

It is important to emphasize that our estimates represent the impact of Greek affiliation on starting salaries for students who are just barely academically eligible to affiliate. It is plausible that the impact of Greek affiliation on earnings varies across the distribution of academic ability. For instance, if members with high initial grades are more likely to be ushered into leadership roles within the organization, they may experience a greater increase in soft skills that are valued in the labor market. Further, we previously found a smaller decline in academic performance among Greeks with higher qualifying GPAs. To the extent that there is a salary penalty for marginal Greeks, it could be mitigated (or potentially reversed) for stronger students. A more thorough examination of these possibilities requires a richer data set including a valid instrument for Greek affiliation.

Discussion and Conclusion

An estimated 750,000 undergraduate students across North America are currently affiliated with Greek social organizations.[32] Despite this prevalence, many of the impacts of Greek life on members remain unclear. We identify the causal effect of Greek affiliation on academic performance using a regression discontinuity design that compares the subsequent academic outcomes of students who are slightly above versus slightly below the GPA eligibility cutoff imposed at the end of the first semester of enrollment. To complement our RD approach and extend the analysis beyond students at the eligibility cutoff, we use an individual fixed effects approach that exploits longitudinal variation in a student's Greek status. Intuitively, this approach compares a student's academic performance at different stages in their Greek life cycle to their own pre-affiliation performance while separately controlling for the impact of accumulated college experience. Both techniques reveal that Greek affiliation causes a statistically and economically meaningful reduction in academic performance.

The impact of Greek affiliation on academic performance is heterogeneous both across individuals and within individuals across time. We find that effects tend to be larger for males, for students with lower aptitude or higher financial need, and during the spring semesters when social activities involving alcohol are more frequent. Academic impacts extend beyond lower course grades to fewer completed credits and selection into easier courses. Contradicting the narrative that Greek affiliation improves student retention, we find no substantial effects of Greek affiliation on retention to sophomore year.

Our results are important in light of the increasing debate surrounding Greek life on university campuses. Proponents argue that Greek life delivers clear benefits to the local area through community service, provides emotional support for members, and fosters the development of leadership skills and professional networks. Critics often cite high-profile behavioral incidents involving Greek members as evidence of detrimental effects. While several universities have taken action in response to low-frequency but tragic outcomes like fatalities, it is also important to understand the impact of Greek affiliation on a broader set of individuals. This paper documents a substantial cost for the average member — reduced academic performance — which should be considered in conjunction with the other costs and benefits of Greek life.

It is possible that the decline in formal academic achievement is offset by gains in other areas that would be rewarded in the labor market. To investigate this, we complement our main analysis with estimates of the impact of Greek affiliation on the starting salaries

[32] This estimate is widely disseminated on university websites. The original source is the North-American Interfraternity Conference, which currently provides an estimate for fraternity membership (384,193 as of 2015-2016) but not for sorority membership.

of graduates. While Greek affiliation is correlated with higher earnings, we provide evidence that this is not a causal effect. Using the regression discontinuity approach, we can rule out even modest positive effects on starting salaries. This finding suggests that Greek affiliation does not provide a substantial labor market payoff for students with marginal academic qualifications at the time of their Greek affiliation.

While our results highlight some of the negative aspects of Greek affiliation, the abundance of students joining fraternities and sororities suggests that there are benefits as well. An obvious question for university administrators is what can be done to minimize these negative effects without an outright ban on such organizations. Our results imply that interventions targeting the pledging process may offer the greatest scope for impact. The largest decline in academic performance occurs during the pledging semester, consistent with the increased burden of learning the organization's history and anecdotal evidence of hazing. Reforms to the pledging process could also benefit active members, as we find that they experience larger declines in academic performance during the spring when the social calendars of Greek organizations are filled with rush, new member education, and additional social events associated with initiation.

While much of the recent attention to Greek life has resulted from tragic incidents associated with hazing, some of the resulting policy changes could alter the Greek effect on academic performance. Some attempted changes include reforming the pledging process and establishing alcohol-free houses. One national fraternity, Sigma Alpha Epsilon, abolished pledging in 2014 and requires that potential members be immediately initiated in an effort to eliminate hazing. In 2000, Phi Delta Theta implemented an alcohol-free housing policy, and North Carolina State University implemented a temporary ban on alcohol at fraternity events in 2015. Little is known about the efficacy of such policies. Future research on the topic would benefit universities and Greek organizations aiming to enhance the academic performance of students.

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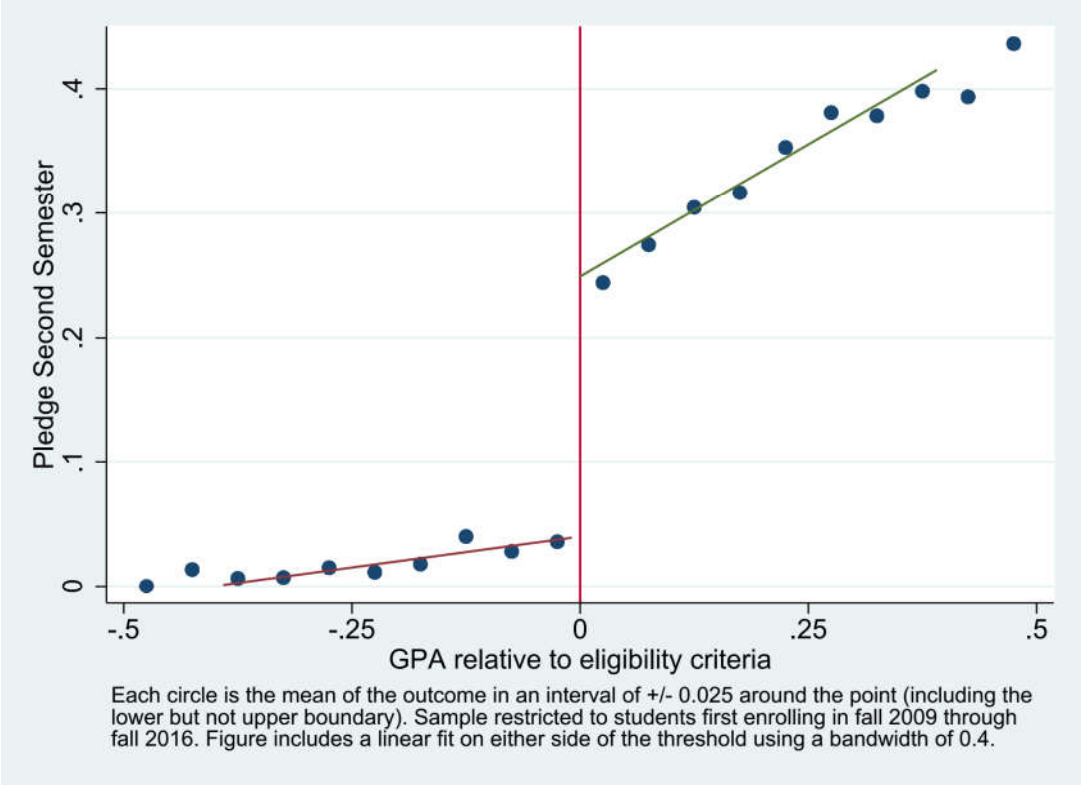
Figure 1. Discontinuity in Second Semester Pledging Probability



Each circle is the mean of the outcome in an interval of +/- 0.025 around the point (including the lower but not upper boundary). Sample restricted to students first enrolling in fall 2009 through fall 2016. Figure includes a linear fit on either side of the threshold using a bandwidth of 0.4.

Figure 2. Distribution of First-semester GPA Relative to Eligibility Cutoff

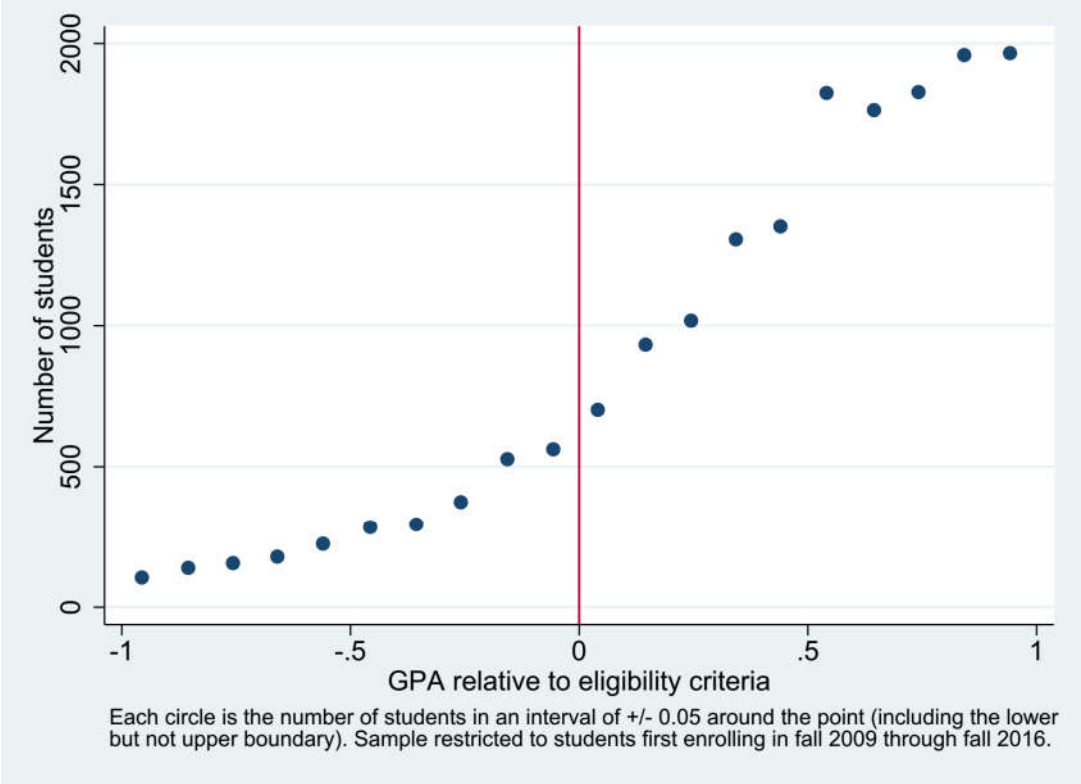
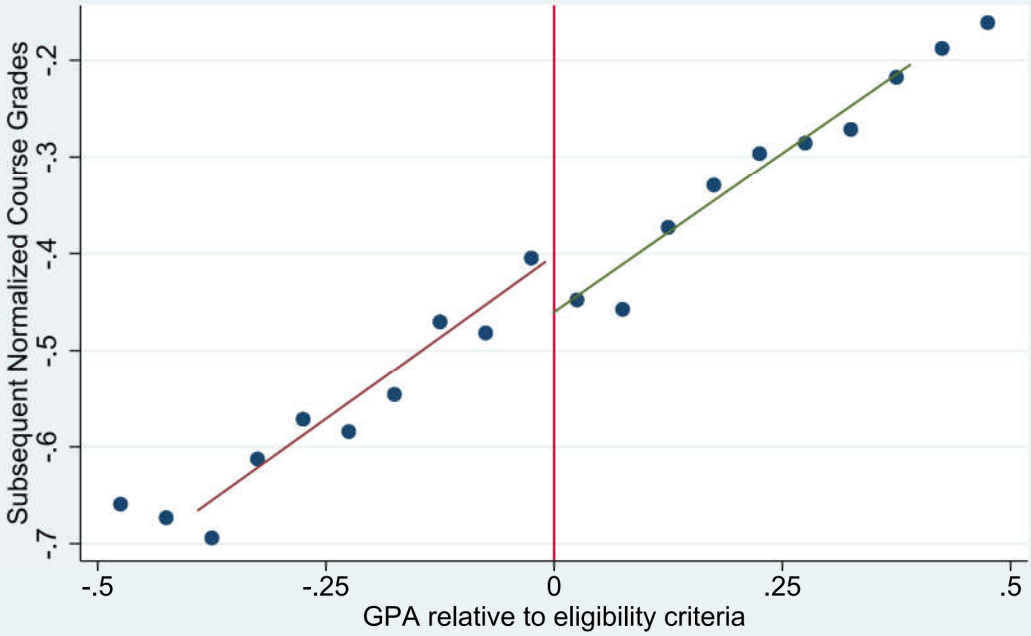


Figure 3. The Effect of Greek Eligibility on Subsequent Normalized Grades



Each circle is the mean of the outcome in an interval of +/- 0.025 around the point (including the lower but not upper boundary). Sample restricted to students first enrolling in fall 2009 through fall 2016 and capped at 12 semesters of experience. Observations are weighted by credit hour. Figure includes a linear fit on either side of the threshold using a bandwidth of 0.4.

Figure 4. The Effect of Greek Eligibility on Retention to Sophomore Year

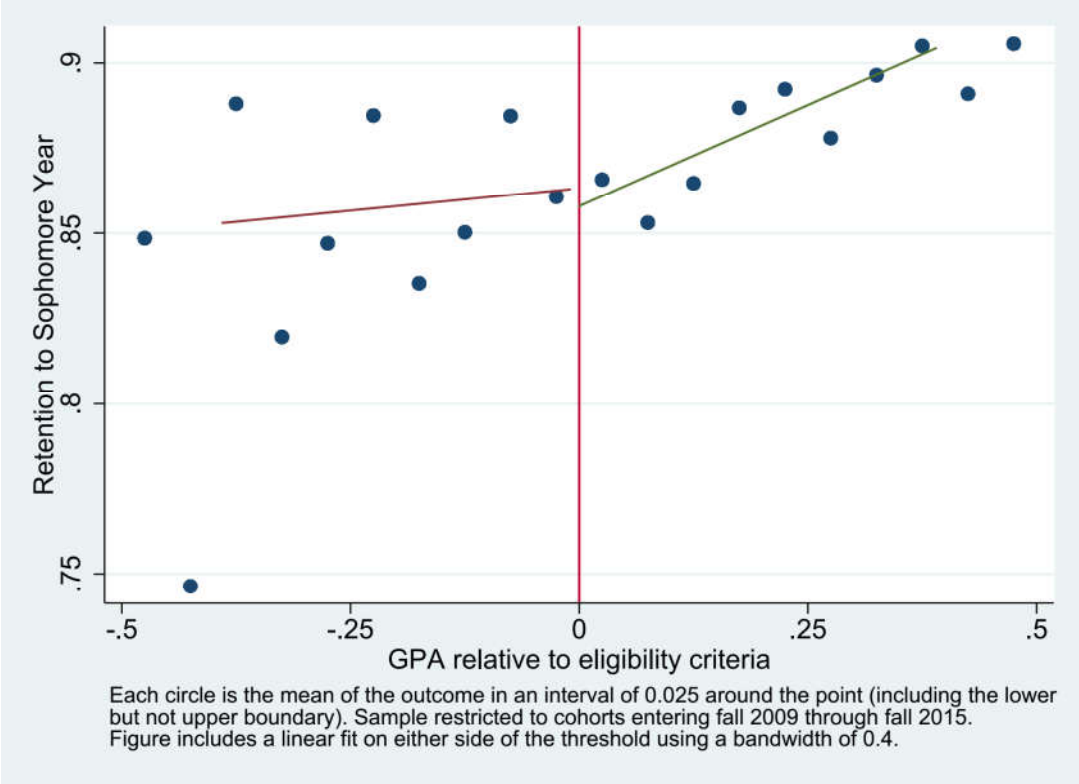


Figure 5. GPA Profiles of Treatment and Comparison Groups

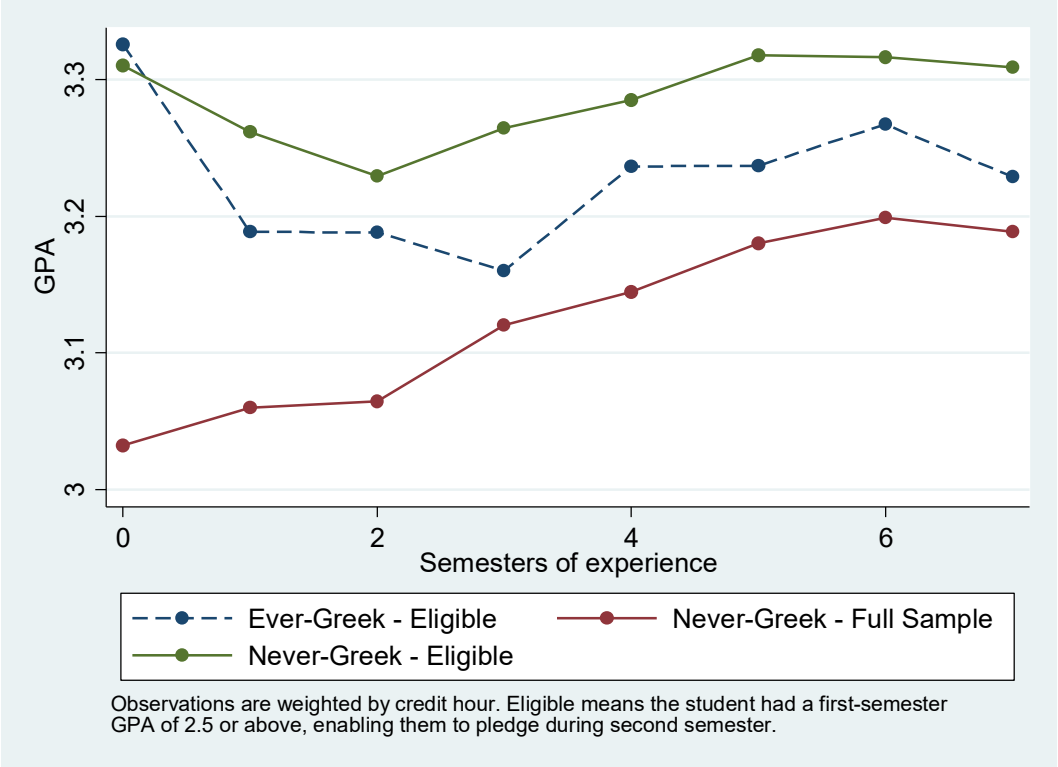
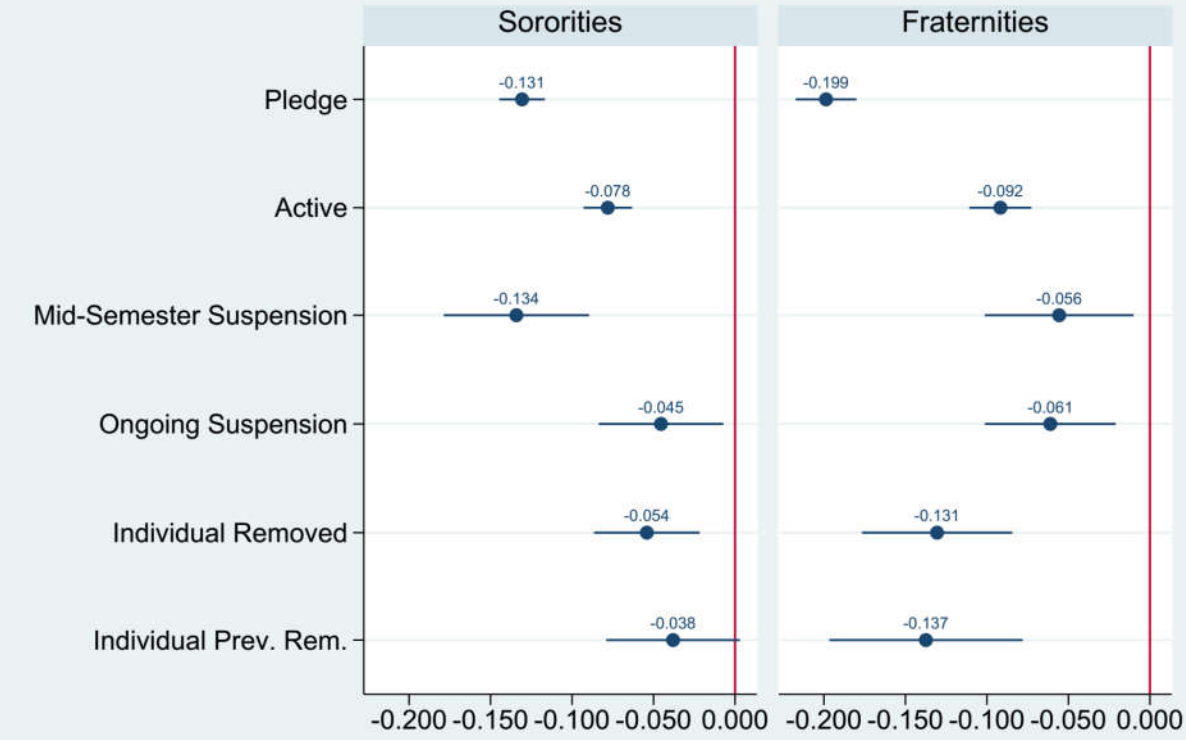
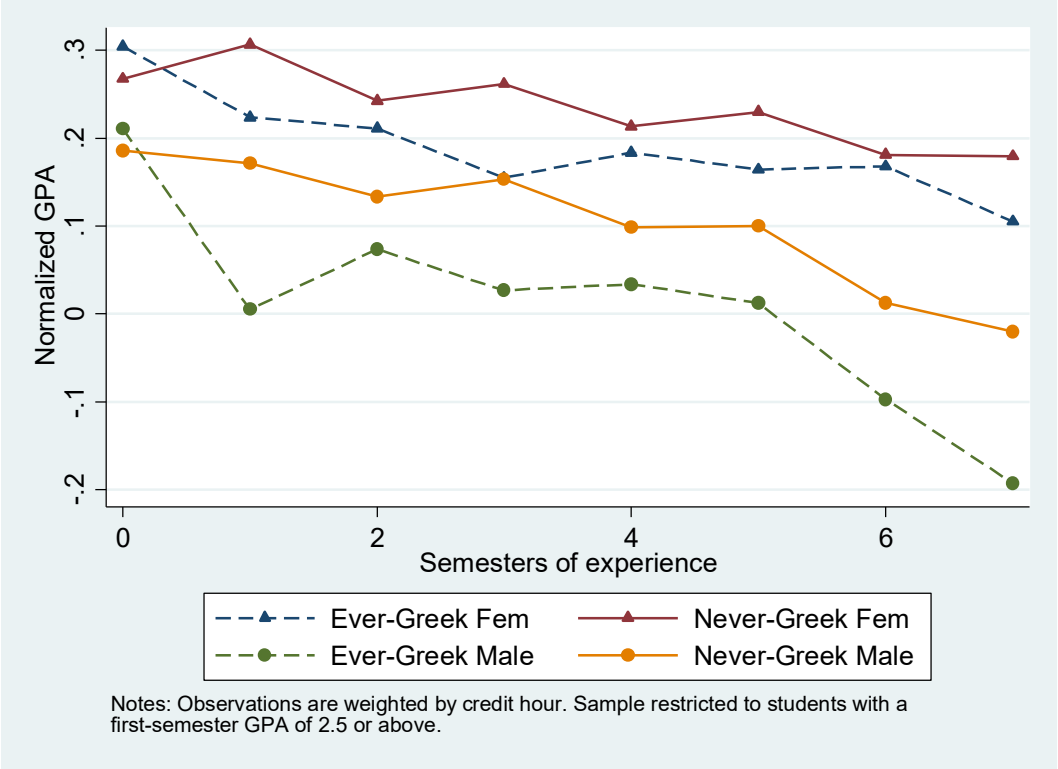


Figure 6. Life Cycle of Greek Effects on Normalized Grades



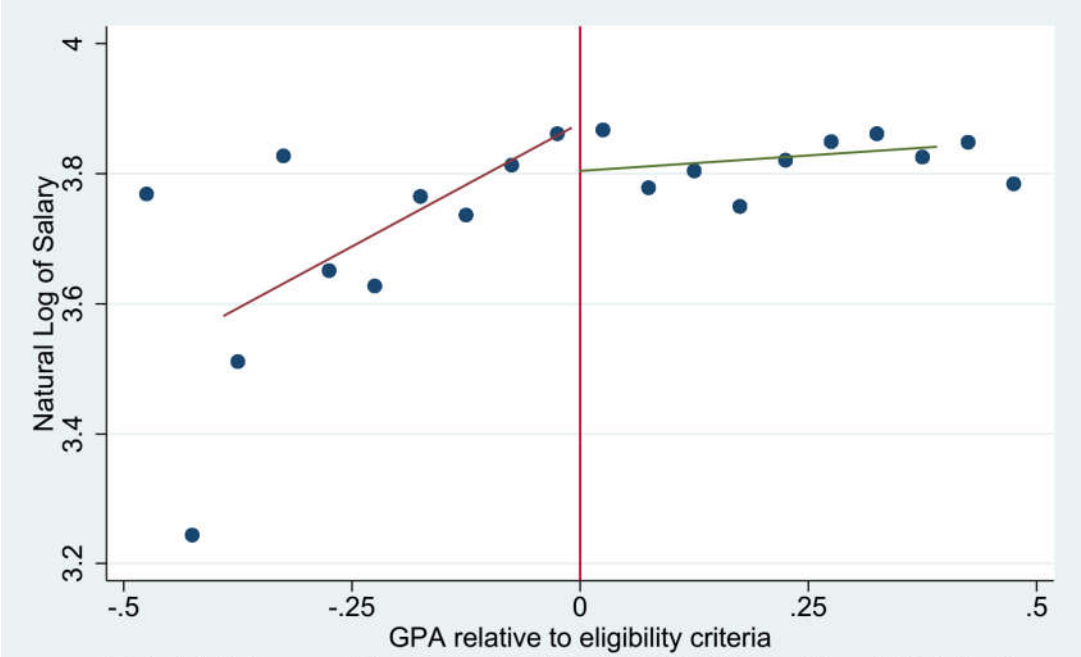
Dots represent point estimates of coefficients, and lines provide 95% confidence intervals. The sample is restricted to students with a first-semester GPA of 2.5 or above and includes the first 12 semesters of experience.

Figure 7. Normalized Grade Profiles by Gender and Greek Status



Notes: Observations are weighted by credit hour. Sample restricted to students with a first-semester GPA of 2.5 or above.

Figure 8. The Effect of Greek Eligibility on Starting Salary



Each circle is the mean of the outcome in an interval of +/- 0.025 around the point (including the lower but not upper boundary). Sample restricted to students first enrolling in fall 2009 through fall 2016, capped at 12 semesters of experience. Figure includes a linear fit on either side of the threshold using a bandwidth of 0.4.

Table 1. Summary Statistics

	Female Non-Greek	Female Greek	Difference	Male Non-Greek	Male Greek	Difference
Student Characteristics						
GPA	3.19	3.32	0.13	2.89	3.06	0.17
Normalized Course Grade	0.06	0.19	0.12	-0.19	-0.02	0.17
ACT Composite Score	26.59	26.65	0.06	27.37	27.31	-0.06
Credit Hours Per Semester	14.78	14.95	0.18	14.11	14.40	0.28
State Resident	0.74	0.55	-0.18	0.70	0.54	-0.16
High or Medium Financial Need	0.33	0.16	-0.17	0.26	0.15	-0.11
Domestic Minority	0.17	0.09	-0.08	0.14	0.09	-0.05
Domestic Non-Minority	0.83	0.91	0.08	0.86	0.91	0.05
Athlete	0.06	0.01	-0.05	0.06	0.01	-0.05
Greek Only Characteristics						
Pledge Second Semester	--	0.88		--	0.80	
Ever Suspended	--	0.05		--	0.12	
Ever Departed	--	0.10		--	0.09	
Observations	9,977	8,189		9,987	6,006	

Note: Sample data consist of domestic undergraduate students from fall 2007 through spring 2017 who initially enrolled in fall 2007 or later.

Table 2. Discontinuities in Observable Characteristics

	(1) Best ACT Equiva-lent	(2) Domestic Minority	(3) Medium or High Financial Need	(4) State Resident	(5) Age at Entry	(6) First-Sem Course Withdraw
Discontinuity	-0.121	-0.006	-0.005	0.015	-0.021	-0.0002
	(0.181)	(0.019)	(0.020)	(0.023)	(0.021)	(0.002)
Observations	5,716	5,716	5,716	5,716	5,716	5,716
Mean of dep. var.	25.9	0.18	0.27	0.64	18.1	0.0014

Note: Regressions test for discontinuity in observable characteristics at the 2.5 GPA eligibility requirement for first semester using a bandwidth of 0.4 GPA points from eligibility. All models are linear in the running variable (GPA). Observations are at the student level. The sample is restricted to students first enrolling in fall 2009 through fall 2016. Standard errors clustered on GPA (to the nearest 100^{th}) are in parentheses.
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 3. Regression Discontinuity Estimates of Greek Effects on Normalized Grades.[a]

	(1)	(2)	(3)	(4)
Panel A				
RD first stage estimates of the impact of eligibility on pledging during second semester				
	Bandwidth =.4[b]	Bandwidth=.4, controls included	Bandwidth=.3, controls included	Bandwidth=.5 controls included
Eligible	0.230***	0.233***	0.229***	0.241***
	(0.017)	(0.018)	(0.021)	(0.016)
First-stage F-stat	177.0	174.4	113.8	235.6
Panel B				
RD estimates of the impact of eligibility on subsequent grades				
Eligible	-0.066*	-0.070**	-0.071*	-0.049*
	(0.033)	(0.033)	(0.036)	(0.029)
Panel C				
RD–IV estimates of the impact of pledging during second semester on subsequent grades				
Affiliate Second Semester	-0.289**	-0.300**	-0.309*	-0.205*
	(0.144)	(0.142)	(0.158)	(0.121)
Observations	129,073	129,073	92,324	166,307

[a] All regressions are weighted by credit hours. Additional controls (Col 2-4) include entering age; ACT score; indicators for female, domestic minority, state resident, and medium or high financial need; and fixed effects for semesters of experience and academic semester. All models are linear in the running variable (GPA). The sample is restricted to students first enrolling in fall 2009 through fall 2016, capped at 12 semesters of experience. Standard errors clustered on GPA (to the nearest 100th) are in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

[b] The bandwidth determines the range of GPAs included in the regression. For example, with a bandwidth of 0.5, GPA scores within 0.5 of the eligibility cut-off (i.e. from 2.0 to 3.0) are included in the regression.

Table 4. Fixed Effects Estimates of the Effect of Greek Affiliation on Grades.[a]

	(1) Full Sample	(2) GPA in 1st Semester≥2.5	(3) GPA in 1st Semester 2.5-2.8	(4) GPA in 1st Semester>2.8
		Females		
Joined a Greek	-0.141***	-0.091***	-0.134***	-0.078***
Organization	(0.007)	(0.007)	(0.024)	(0.007)
Sample Size	528,255	482,096	50,059	432,037
		Males		
Joined a Greek	-0.179***	-0.124***	-0.176***	-0.111***
Organization	(0.008)	(0.009)	(0.026)	(0.009)
Observations	463,694	395,346	57,680	337,666

[a] The dependent variable is the normalized course grade (see main text for details). All regressions are weighted by credit hours and include fixed effects for each student, academic semester, and semesters of experience. Standard errors clustered at the individual level are in parentheses. The sample is restricted to observations with fewer than 12 semesters of experience. * $p < .10$, ** $p < .05$, *** $p < .01$

Table 5a. Fixed-effects Estimates of the Effect of Greek Status on Grades, Completed Credits, and Course Difficulty: Females.[a]

	A grade	B grade	C grade	D grade	F grade	Withdraw	Credits	Course Avg.
Pledge	-0.053***	0.014***	0.024***	0.007***	0.000	0.006***	-0.339***	0.013***
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.042)	(0.004)
Active	-0.023***	0.013***	0.009***	0.002**	-0.001	-0.001	-0.214***	-0.001
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.041)	(0.004)
Mid-semester Suspension	-0.057***	0.021*	0.029***	0.001	0.001	0.003	-0.371***	-0.009
	(0.012)	(0.012)	(0.009)	(0.003)	(0.002)	(0.003)	(0.136)	(0.011)
Ongoing Suspension	-0.009	0.012	-0.003	0.004	-0.002	-0.002	-0.016	0.001
	(0.010)	(0.010)	(0.006)	(0.003)	(0.001)	(0.002)	(0.103)	(0.009)
Individual Removed	-0.020**	0.015*	0.001	0.002	-0.000	0.002	0.093	0.005
	(0.008)	(0.009)	(0.006)	(0.003)	(0.002)	(0.003)	(0.108)	(0.008)
Individual Prev. Rem.	-0.013	0.014	0.001	0.003	0.001	-0.004	0.135	-0.001
	(0.010)	(0.009)	(0.006)	(0.003)	(0.002)	(0.003)	(0.130)	(0.010)
Observations	490,868	490,868	490,868	490,868	490,868	490,868	96,837	490,492
Mean of Dependent Variable	0.542	0.323	0.095	0.015	0.005	0.018	14.84	3.21

[a] All regressions are weighted by credit hour and include fixed effects for each student, semesters of experience, academic semester, and subject level. Sample restricted to individuals eligible to pledge during second semester and to observations with fewer than 12 semesters of experience. Standard errors clustered at the individual level are in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

Table 5b. Fixed-effects Estimates of the Effect of Greek Status on Grades, Completed Credits, and Course Difficulty: Males.[a]

	A grade	B grade	C grade	D grade	F grade	Withdraw	Credits	Course Avg.
Pledge	-0.073***	0.009*	0.030***	0.009***	0.004***	0.019***	-0.805***	0.033***
	(0.004)	(0.005)	(0.004)	(0.002)	(0.001)	(0.002)	(0.052)	(0.004)
Active	-0.032***	0.011**	0.013***	0.004***	-0.001	0.003**	-0.115**	-0.003
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.002)	(0.048)	(0.004)
Mid-semester Suspension	-0.038***	0.037***	0.004	0.001	-0.003	-0.004	-0.083	-0.005
	(0.010)	(0.012)	(0.009)	(0.004)	(0.003)	(0.004)	(0.123)	(0.010)
Ongoing Suspension	-0.027***	0.026***	0.006	-0.000	-0.001	-0.005	0.149	-0.027***
	(0.009)	(0.009)	(0.007)	(0.003)	(0.002)	(0.003)	(0.109)	(0.008)
Individual Removed	-0.040***	-0.000	0.020**	0.006	0.004	0.010**	-0.175	-0.002
	(0.010)	(0.011)	(0.008)	(0.004)	(0.003)	(0.004)	(0.130)	(0.010)
Individual Prev. Rem.	-0.028**	-0.014	0.024***	0.003	0.007	0.009*	-0.052	0.023**
	(0.012)	(0.013)	(0.009)	(0.004)	(0.004)	(0.005)	(0.170)	(0.010)
Observations	406,808	406,808	406,808	406,808	406,808	406,808	80,611	406,434
Mean of Dependent Variable.	0.415	0.379	0.139	0.024	0.010	0.028	14.44	3.10

Table 6. Heterogeneous Effects of Greek Affiliation.[a]

	(1)	(2)	(3)	(4)	(5)
Interaction variable	Low-ACT	Financial Need	Colonize	Pre-Suspension	Spring
			Females		
Pledge	-0.117***	-0.130***	-0.132***	-0.132***	-0.132***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Active	-0.091***	-0.071***	-0.078***	-0.079***	-0.051***
	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
Interaction Variable * Pledge	-0.026**	0.000	0.012	0.016	[b]
	(0.010)	(0.015)	(0.022)	(0.024)	
Interaction Variable * Active	0.024**	-0.037**	-0.009	0.010	-0.057***
	(0.011)	(0.015)	(0.022)	(0.022)	(0.006)
Observations	482,096	482,096	482,096	482,096	482,096
			Males		
Pledge	-0.182***	-0.196***	-0.202***	-0.191***	-0.200***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Active	-0.082***	-0.086***	-0.092***	-0.087***	-0.074***
	(0.012)	(0.010)	(0.010)	(0.010)	(0.010)
Interaction Variable * Pledge	-0.041**	-0.016	0.028	-0.067***	
	(0.016)	(0.022)	(0.026)	(0.025)	
Interaction Variable * Active	-0.024	-0.035*	0.001	-0.023	-0.039***
	(0.015)	(0.021)	(0.024)	(0.017)	(0.007)
Observations	395,346	395,346	395,346	395,346	395,346

[a] All models include fixed effects for semesters of experience, academic semester, and student, and are weighted by credit hours. Sample restricted to individuals eligible to pledge during second semester and to observations with fewer than 12 semesters of experience. Standard errors clustered at the individual level in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$.

[b] The spring * pledge interaction is omitted because pledging occurs in spring and the interaction would be perfectly collinear with the pledge dummy.

Table 7. Estimated Effect of Greek Siblings on Grades.[a]

	Female	Male
Joined a Greek Organization	-0.062***	-0.090***
	(0.011)	(0.013)
Number of Greek Siblings from Same	0.009***	0.024***
Chapter in Course	(0.002)	(0.002)
Number of Greek Siblings from Same	0.000	-0.000
Chapter in First Major[b]	(0.000)	(0.001)
Numbers of Siblings in Chapter (in 100s)	-0.025***	-0.063***
	(0.006)	(0.014)
Enrollment in Section (100s)	-0.043***	0.030***
	(0.003)	(0.004)
Observations	482,096	395,346

[a] Dependent variable is normalized course grade (see main text for details). All regressions are weighted by credit hour and include fixed effects for semesters of experience and academic semester. Sample is restricted to students with a GPA of 2.5 or above at end of first semester and to observations with fewer than 12 semesters of experience. Standard errors clustered at the individual level in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

[b] First major is measured as major in fourth semester. If a person has more than one major, one of the majors is randomly selected.

Table 8. The Effect of Greek Affiliation on Starting Salary

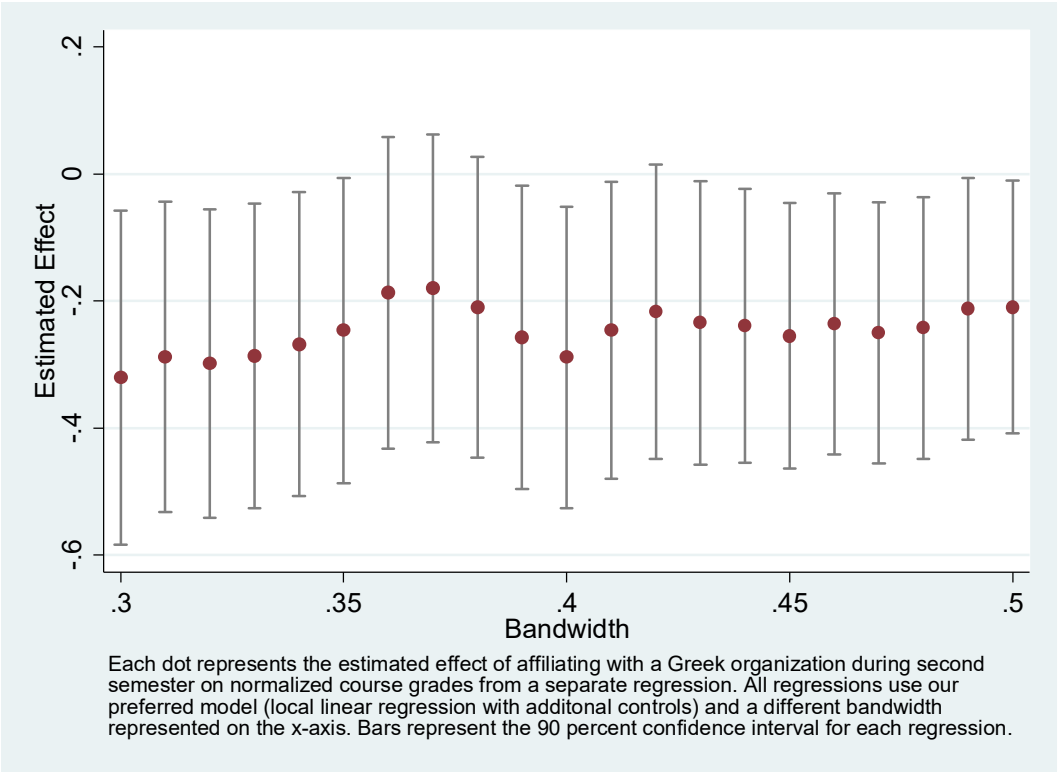
	(1)	(2)	(3)	(4)	(5)
	OLS				RD
Affiliate Second Semester	0.144***	0.107***	0.0880***	0.0891***	-0.185
	(0.011)	(0.010)	(0.010)	(0.026)	(0.174)
Control for Entering Division	No	Yes	Yes	Yes	Yes
Restrict Sample to Full-time	No	No	Yes	Yes	Yes
Restrict to RD Sample	No	No	No	Yes	Yes
Observations	4842	4842	4059	677	677

The dependent variable in all columns is the natural log of annual salary. Additional controls in all columns include entering age; ACT score; and indicators for female, domestic minority, state resident, medium or high financial need, graduation year, and graduation season. The sample is restricted to cohorts graduating in Spring 2013 through Spring 2017 who responded to a university labor market survey. Columns 3-5 further limit the sample to full-time workers who are not enrolled in continuing education. RD model uses a bandwidth of 0.4 GPA points, controls for a linear function of qualifying GPA, and allows the slope to vary on either side of the cutoff. First Stage F-statistic for RD model is 53.8. Standard errors are in parenthesis, robust for OLS, clustered on GPA (to the nearest 100th) for RD.

* $p < .10$, ** $p < .05$, *** $p < .01$

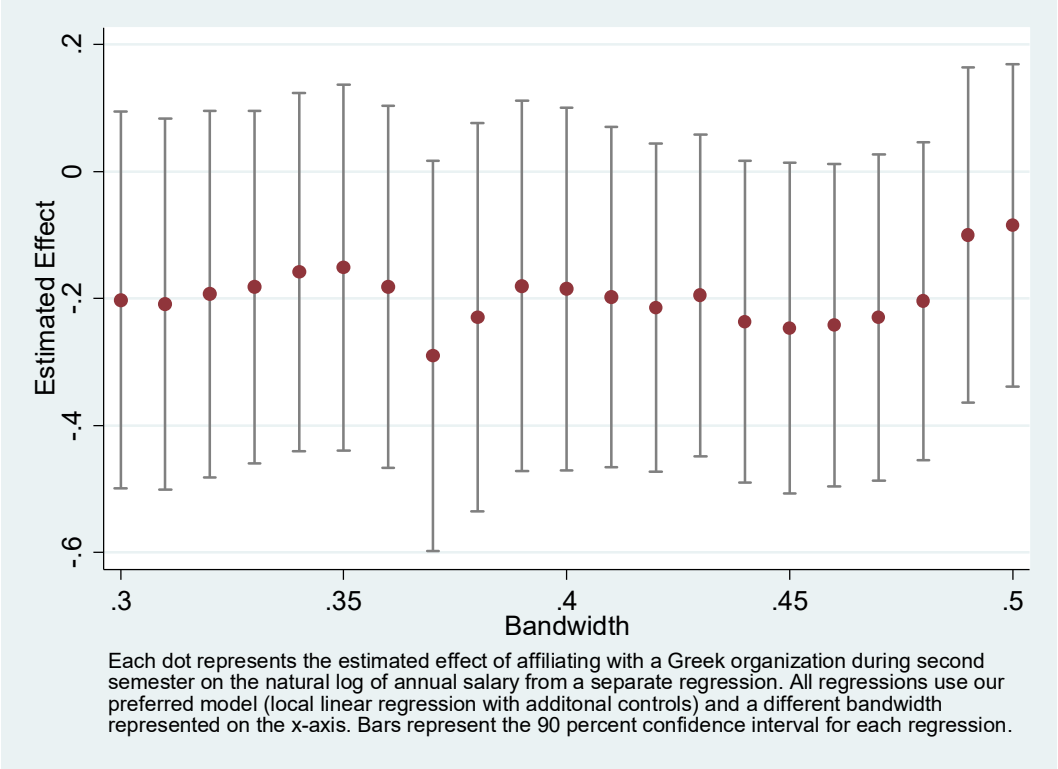
Appendix – For Online Publication

Figure A1. RD Estimates of the Effect of Greek Affiliation on Subsequent Grades



Each dot represents the estimated effect of affiliating with a Greek organization during second semester on normalized course grades from a separate regression. All regressions use our preferred model (local linear regression with additonal controls) and a different bandwidth represented on the x-axis. Bars represent the 90 percent confidence interval for each regression.

Figure A2. RD Estimates of the Effect of Greek Affiliation on Starting Salary



Each dot represents the estimated effect of affiliating with a Greek organization during second semester on the natural log of annual salary from a separate regression. All regressions use our preferred model (local linear regression with additonal controls) and a different bandwidth represented on the x-axis. Bars represent the 90 percent confidence interval for each regression.

Table A1. Typical Greek Status Life Cycle

Status	Description	Typical Duration
Pre-affiliation	The time period prior to pledging a Greek organization. At the university (and at many other institutions), students are required to complete at least one semester as a full-time student prior to pledging a fraternity or sorority.	About 85% of Greeks in our sample spend only the minimum, one semester, pre-affiliation.
Pledge	A probationary member of a fraternity or sorority. After a brief recruitment period, existing members vote on whether to extend bids to prospective members, who in turn decide whether to accept the bids. Matched students become pledges, undergoing new member education that lasts for much of the semester. Nationally, many well-publicized hazing incidents have been tied to the pledging process.	One semester
Active Member	An initiated full-member of a sorority or fraternity.	Remainder of undergraduate career
Mid-semester Suspension*	Chapters found to be in violation of university or national organization policy may be suspended, especially if offenses are egregious or repeated. When a chapter is suspended, it is no longer recognized by the university and may not host any sanctioned events, whether social or service-oriented.	Maximum of one semester
Ongoing Suspension*	For the duration of a suspension, the chapter is unrecognized by the university and may not host any sanctioned events, whether social or service-oriented.	Duration varies based on infraction severity.

*The majority of chapters were never suspended during our sample period.

Table A2. Regression Discontinuity Robustness Checks [a]

	(1)	(2)	(3)	(4)
Panel A: RD first stage estimates of the impact of eligibility on pledging during second semester				
Eligible	0.230***	0.222***	0.226***	0.228***
	(0.017)	(0.027)	(0.024)	(0.019)
Panel B: RD estimates of the impact of eligibility on subsequent grades				
Eligible	-0.066*	-0.078*	-0.088**	-0.072**
	(0.033)	(0.046)	(0.040)	(0.035)
Panel C: RD – IV estimates of the impact of pledging during second semester on subsequent grades				
Affiliate Second Semester	-0.289**	-0.351	-0.389**	-0.317**
	(0.144)	(0.214)	(0.179)	(0.150)
Bandwidth	.4	.4	.5	.4
Polynomial	Linear	Quadratic	Quadratic	Linear
Sample	Baseline	Baseline	Baseline	Drop 2.5 GPA
First-stage F-Stat	177.0	67.5	86.9	144.4
Observations	129,073	129,073	166,307	126,253

[a] Additional controls used in all columns include entering age; ACT score; indicators for female, domestic minority, state resident, and medium or high financial need; and fixed effects for semesters of experience and academic semester. All regressions are weighted by credit hours. All models are linear in the running variable (GPA). The sample is restricted to students first enrolling in fall 2009 through fall 2016, capped at 12 semesters of experience. Standard errors clustered on GPA (to the nearest 100th) are in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$

Table A3. Fixed Effects Estimates of the Effect of Detailed Greek Status on Grades. [a]

	Females				Males			
	Female Full Sample	Female 2.5+ GPA	Female 2.5-2.8 in Sem1	Female >2.8 in Sem1	Male Full Sample	Male 2.5+ GPA	Male 2.5-2.8 in Sem1	Male >2.8 in Sem1
Pledge	-0.164***	-0.131***	-0.200***	-0.118***	-0.236***	-0.199***	-0.241***	-0.189***
	(0.007)	(0.007)	(0.027)	(0.007)	(0.009)	(0.010)	(0.030)	(0.010)
Active	-0.135***	-0.078***	-0.119***	-0.063***	-0.155***	-0.092***	-0.150***	-0.077***
	(0.008)	(0.008)	(0.028)	(0.008)	(0.010)	(0.010)	(0.029)	(0.010)
Mid-semester Suspension	-0.167***	-0.134***	-0.199**	-0.121***	-0.119***	-0.056**	-0.028	-0.053**
	(0.022)	(0.023)	(0.086)	(0.023)	(0.023)	(0.023)	(0.070)	(0.024)
Ongoing Suspension	-0.095***	-0.045**	-0.086	-0.034*	-0.133***	-0.061***	-0.089	-0.054**
	(0.019)	(0.020)	(0.067)	(0.020)	(0.021)	(0.020)	(0.055)	(0.022)
Individual Removed	-0.105***	-0.054***	-0.009	-0.052***	-0.186***	-0.131***	-0.236***	-0.110***
	(0.017)	(0.017)	(0.053)	(0.017)	(0.023)	(0.024)	(0.070)	(0.025)
Individual Previously Removed	-0.099***	-0.038*	-0.034	-0.036	-0.200***	-0.137***	-0.262***	-0.113***
	(0.021)	(0.021)	(0.054)	(0.022)	(0.029)	(0.030)	(0.091)	(0.031)
Observations	528,255	482,096	50,059	432,037	463,694	395,346	57,680	337,666

[a] The dependent variable is the normalized course grade (see main text for details). All regressions are weighted by credit hours and include fixed effects for each student, semesters of experience, and academic semester. Sample is limited to observations with fewer than 12 semesters of experience. Standard errors clustered at the individual level in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$