CONTEMPORARY ECONOMIC POLICY

SOCIAL ANIMAL HOUSE: THE ECONOMIC AND ACADEMIC CONSEQUENCES OF FRATERNITY MEMBERSHIP

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We exploit changes in the residential and social environment on campus to identify the economic and academic consequences of fraternity membership at a small Northeastern college. Our estimates suggest that these consequences are large, with fraternity membership lowering student grade point average by approximately 0.25 points on the traditional 4-point scale, but raising future income by approximately 36%, for those students whose decision about membership is affected by changes in the environment. These results suggest that fraternity membership causally produces large gains in social capital, which more than outweigh its negative effects on human capital for potential members. Alcohol-related behavior does not explain much of the effects of fraternity membership on either the human capital or social capital effects. These findings suggest that college administrators face significant trade-offs when crafting policies related to Greek life on campus. (*JEL* I23, J24, I12)

I. INTRODUCTION

For a certain generation of Americans, the image of fraternities is indelibly linked to *National Lampoon's Animal House* (1978), a fictionalized account of a group of hedonistic fraternity brothers at a U.S. college.[1] Interestingly, the movie ends by revealing that the students in question have gone on to become, inter alia, a doctor, a lawyer, and a U.S. senator. While these "where are they now" snippets are clearly intended as satire, they raise important questions about the long-run economic consequences of fraternity membership. Do the members of actual fraternities prosper relative to nonmembers, and if so, do they prosper because of, or in spite of, their participation in Greek life?

The existing literature provides incomplete and at times contradictory evidence on this question. To begin with, while several papers investigate the economic consequences of fraternity membership, they focus on its impact on a graduate's initial employment opportunities. For example, Routon and Walker (2014) report that fraternity membership increases the probability of a recent graduate obtaining a job, and Marmaros and Sacerdote (2002) find that fraternity membership is positively associated with networking and with finding a high-paying job directly out of college.[2] It is unclear, however, to what degree these initial placements are correlated with the long-run equilibrium outcomes. It may be that the economic benefits of fraternity membership diminish over time, as the labor market sorts out underqualified fraternity members and correctly identifies and rewards talented nonmembers.

*Thanks to Caleb Yoken for excellent research assistance.

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1. The portrayal of fraternity life in the movie draws on the college experiences of its writers at Dartmouth College, Washington University, and McMaster University.

2. Popov and Bernhardt (2012) provide a theoretical treatment of student rush and fraternity member selection in which membership signals student quality to potential employers.

ABBREVIATIONS

2SLS: Two-Stage Least Squares
GPA: Grade Point Average
IPEDS: Integrated Postsecondary Education Data System
IV: Instrumental Variable
LATE: Local Average Treatment Effect
OLS: Ordinary Least Squares

Contemporary Economic Policy (ISSN 1465-7287)
Vol. 36, No. 2, April 2018, 263–276
Online Early publication August 10, 2017
doi:10.1111/coep.12249

Second, any advantage fraternity membership conveys with respect to developing social capital and connections may be partly or fully offset by its deleterious effect on human capital formation. Both Grubb (2006) and Routon and Walker (2014) find that fraternity membership is associated with significantly lower college grades. In addition, a substantial literature links fraternity membership to increased drinking and increased binge drinking (Alva 1998; Cashin, Presley and Meilman 1998; Chaloupka and Wechsler 1996; DeSimone 2007, 2009), which provides a plausible channel through which membership may affect academic performance. As a result, any attempt to estimate the long-run consequences of fraternity membership should account for its influence on both human and social capital.

In this paper, we present evidence on the impact of fraternity membership on the academic and economic performance of the alumni of one Northeastern college. Our results are based on an alumni survey administered in the fall of 2009, with detailed questions on income, employment, collegiate social activities, academic performance, and personal characteristics. After restricting the data to men who are currently employed full time, the data include more than 1,600 observations for alumni with graduation dates that span over 40 years.

The structure of our survey allows us to address two key issues that have not been considered in the literature. First, we are able to investigate the impact of fraternity membership on an individual's future income.[3] The use of income has a number of advantages. First, income is a more finely grained measure of the economic return to fraternity membership than employment status, and second, the longer time horizon may provide a better estimate of the equilibrium impact of fraternity membership. Finally, as income levels likely reflect the impact of both human and social capital, their use provides a more comprehensive measure of the economic impact of fraternity membership.

A second advantage of the long time period covered by our dataset is that it allows us to employ a unique strategy for identifying the causal effects of fraternity membership. Identifying the effect of fraternity membership is a challenge due to selection bias. As DeSimone (2007, 338) notes, there is concern that "students choose to join fraternities in part because of preexisting preferences toward behaviors that membership facilitates." Thus, it is difficult to tell whether fraternity membership decreases grades and increases drinking and social networking, or whether low achieving, hard drinking, and highly social students select into fraternities. The available evidence suggests causation likely runs in both directions. For example, Sacerdote (2001) finds that high school drinking behavior predicts fraternity membership.

The existing literature employs a number of strategies to isolate the causal effect of fraternity membership on individual behavior and outcomes. A number of papers address causation by controlling for a large number of potential covariates. For example, to identify the causal effect of fraternity membership on binge drinking, DeSimone (2007) controls for situational and total alcohol use. A downside of this approach is that it may result in over controlling and thus underestimate the impact of fraternity membership. For example, after controlling for a large number of potential covariates, Grubb (2006) reports that fraternity membership lowers grades by 2.2%, an estimated effect that may seem small relative to the priors of many casual observers and may be too small to justify dramatic interventions. Similarly, Routon and Walker (2014) use a propensity score matching approach, which does not control for the influence of unobserved individual characteristics that may be related to the propensities to study, drink, or socialize. Finally, DeSimone (2009) controls for drinking behavior 3 years after graduation, but it is unclear how this approach might extend to address other areas of interest, such as grades or economic outcomes.

In this paper, we identify the causal effect of fraternity membership on college grades and future income levels by exploiting time variation in the college's social and residential environment. We use the presence of theme houses and non-Greek social houses and the presence of female students on campus, all of which may affect students' choices about whether to join a Greek organization, as instruments for Greek membership. These changes allow us to identify shifts in the probability of fraternity membership that are plausibly exogenous and, thereby, to estimate the impact of fraternity membership on an individual's academic and economic performance. We include controls for student human and social capital endowments to alleviate concerns that the policy changes that generate our

3. While it is perhaps most natural to think of fraternity membership affecting labor market outcomes, recent work suggests social capital also affects entrepreneurship and investment income, for example, Guiso, Sapienza, and Zingales (2004).

TABLE 1
Summary Statistics

Variable	Description	Mean	Std. Dev.	Min	Max
greekmem	Binary variable for frat membership	0.5752	0.4944	0	1
collegegrade	GPA, 0–4 scale	3.1509	0.5136	1	4
income	Income (converted from ranges)	174,017	113,882	25,000	350,000
lnincome	Log of annual income	11.815	0.7578	10.1266	12.7656
age	Age at time of response	45.794	11.931	24	69
raceblack	Binary variable for African American	0.0143	0.1191	0	1
racehisp	Binary variable for Hispanic	0.0077	0.0879	0	1
raceasian	Binary variable for Asian American	0.0071	0.0845	0	1
sat00	SAT score in 100s of points	12.082	1.3172	8	15
appearance	College appearance, self-rated 1–5	3.4469	0.7630	0	5
binge	Binary variable for binging in college	0.2681	0.4431	0	1
nightsdrinking	Nights drinking per week in college	2.7720	1.6146	0	7
themes	Binary variable for theme houses	0.4475	0.4974	0	1
coed	Binary variable for coeducation	0.8692	0.3373	0	1
Minervas	Binary variable for Minerva houses	0.0672	0.2504	0	1

instruments may have altered the composition of the student body. An additional advantage of using these instruments is that they are clearly choice variables from the perspective of the college administration. Thus, our results provide an estimate of the impact of several dimensions of college policy toward Greek life on fraternity membership, student grades, and expected future income levels.

We find that the academic and economic consequences of fraternity membership are quite large. Fraternity membership reduces a student's grade point average (GPA) by approximately 0.25 points on a 4-point scale. Moreover, controlling for alcohol-related behavior only slightly reduces this effect, suggesting that college policies designed to reduce alcohol use at fraternities will have only limited academic benefits. We also find that, in spite of the strong negative effect on human capital accumulation, fraternity membership increases expected future income by approximately 36%. This suggests that the negative effect of fraternity membership on human capital accumulation is more than offset by its positive impact on social capital formation. For this reason, joining a fraternity may be a rational decision that improves the long-term prospects of an individual student despite its damaging effects on that student's grades. Since our results are drawn from data on a single college, they may have limited external validity. However, it is reasonable to expect the qualitative effects of fraternity membership to be similar at similar institutions. Our results indicate that college administrators face an important trade-off when they consider policies designed to limit fraternity life on campus: while such policies may significantly raise academic performance, these gains may come at a significant cost in terms of expected future income for their graduates.

II. DATA

Our data come from a survey administered in 2009 to alumni of one Northeastern liberal arts college. A total of 3,762 alumni responded to the survey, a response rate of 25.8%. The survey asked respondents for information about their demographic characteristics, college activities, academic achievement, and current work status and income. In the analysis below, we limit the sample to men under the age of 65 who are employed full time and for whom all of the control variables are present, resulting in 1,667 observations.[4] Alumni who graduated in the 1970s represent 31% of the sample and are somewhat over-represented compared with the population percentage of alumni from that generation; percentages of alumni from other decades are comparable to the population percentage. Measures of the institution-specific variables come from college records. Descriptive statistics for all of the variables used in the analysis are found in Table 1.

Our treatment variable, *Greekmem*, is an indicator variable that is equal to 1 if the respondent

4. We also examined the effects of sorority membership on grades and income, but the female student sample is smaller than the male student sample, as the college did not admit female students until 1970. We found little significant effect of sorority membership on academic or economic outcomes, so we restrict attention here to fraternity membership.

was a member of a fraternity and equal to 0 if not. Fifty-seven percent of alumni in our sample report belonging to a fraternity, which is somewhat higher than the 46% of all male alumni that were fraternity members. Greek alumni may be over-represented in the survey due to greater attachment to the college. Membership is somewhat higher for alumni who graduated in the 1960s, 75%, and somewhat lower for those graduating in the 1970s and 2000s, 46% and 50%, respectively.

We use two outcome variables. *GPA* is the respondent's self-reported grade point average on a 4-point scale. It is our main measure of collegiate human capital formation. For current income, we ask respondents to identify the range within which their average annual income for the last 3 years falls. We convert income ranges to dollar figures, and then take the natural log of these numbers to produce the variable *Log(income)*.[5] We also ask if the respondent is currently employed full time, part time, or not employed. In the regressions below, we limit the sample to full-time workers, and our results should be interpreted as being conditional on selecting full-time work.[6]

We also use a number of demographic variables that may affect a student's choice of college activities, academic achievement, or postcollege income. These include *Age*, *Age Squared*, and a set of indicator variables for the respondent's race and ethnicity, including *African American, Asian, Hispanic,* and *Other race*. The reference race-ethnicity category is non-Hispanic White. These variables control for systematic difference across student populations in labor market and academic outcomes and in opportunities for collegiate social capital accumulation that might otherwise provide alternative causal channels between fraternity membership and the two outcome variables. For example, there could be a positive correlation between fraternity membership and income if minority students face discrimination in both the Greek system and in labor markets; controlling for race prevents this effect from biasing our estimates. Our sample contains somewhat more white students than the population as a whole; the Integrated Postsecondary Education Data System (IPEDS) shows that the college's enrollments since 2001 are about 13% minority, while our sample of alumni, in the years for which we can compare to IPEDS data, is only about 7% minority. The variables *Age* and *Age Squared* control for a quadratic relationship in the evolution of the college academic and social environment, such as grade inflation and social norms related to Greek life.

In addition, we include two student characteristics that may affect aptitude for or interest in different college activities. The variable *SAT00* is the respondent's self-reported score on the SAT (in hundreds of points). We interpret this variable as a control for a variety of individual characteristics that affect a student's academic performance in college, for example, intellectual ability, work effort, and socioeconomic background. We compared reported SAT scores in our sample to those available on IPEDS for those years for which IPEDS has data on interquartile ranges (2001 and following) and they are extremely similar, so our sample appears representative on this dimension.

The variable *Appearance* corresponds to a respondent's self-assessment of their physical attractiveness during their college years. We include this variable on the theory that physical attractiveness may influence student opportunities for social capital accumulation. Glaeser, Laibson and Scheinkman (2000) present a model in which attractiveness and charisma increase the return to trusting behavior in others. In two experiments conducted with Harvard University undergraduates, they test this effect using a dummy variable for whether an individual has a sexual partner and find this variable to be highly significant in inducing trusting behavior. Because social norms regarding premarital sex have changed dramatically over the period of our study, we do not ask about sexual partners but rely instead on a measure of self-assessed attractiveness. Hamermesh and Biddle (1994) show that physical attractiveness matters for labor market outcomes. The effect is not due to occupational sorting, but reflects some sort of productivity difference or customer discrimination.

5. The income variable is derived from the following question. "What range best describes your annual income over the past three years?" Respondents selected one of six income ranges: 1) under $50,000, 2) $50,000–75,000, 3) $75,000–100,000, 4) $100,000–$150,000, 5) $150,000–250,000, and 6) over $250,000. For categories 1)–5), annual income was defined as the midpoint of the income range. For category 6), annual income was top coded to $350,000. The annual income variable is then logged to obtain the income measure used in the analysis.

6. This could cause problems for our estimation strategy if Greeks were more likely to be full-time workers than non-Greeks, or vice versa. However, that is not the case in the data. The full-time employment rate overall is 82.002%. For Greeks, it is 81.646%, and for non-Greeks, it is 82.068%; the difference of the means for the two groups is not statistically significant, with a t-statistic of 0.25.

We also ask two questions about drinking habits; one about frequency, one about intensity. *Nightsdrinking* is the self-reported number of nights per week the respondent drank in college. We also ask the respondent's subjective measure of his drinking intensity on a 5-point scale, with categories ranging from *Did Not Drink* to *Very Heavy*. We convert this to an indicator variable, *Binge*, which is 1 if the respondent gave an answer of 4 or 5, which correspond to *Heavy* and *Very Heavy* drinking, to this question, and 0 if the respondent answered 1, 2, or 3.[7] Although these variables are likely to be affected by fraternity membership, and hence are not exogenous, we use them in some specifications to identify the part played by alcohol use in the Greek system's effects on human and social capital formation. By using both dimensions of drinking behavior, our analysis permits frequent and intense drinking to affect human and social capital accumulation differently.

The reliance on self-reported rather than administrative data for GPA and SAT scores may introduce measurement error into these variables. Social desirability may bias these variables upward and, moreover, errors in the measurement of these variables may be more pronounced among older respondents, for whom the memory of actual GPA and SAT scores may be less precise. However, to the degree that the error in reported GPA and SAT scores, or in other self-reported variables such as drinking frequency and intensity and college appearance, is a function of age, we expect it to be controlled for by including age and age squared in our regressions.

Finally, we collect several variables that describe important aspects of student residential options and the social environment of the college. *Minervas* is a binary variable for the presence of Minerva houses at the college, which are student houses created in 2004 to provide a social alternative to Greek life. All students are members of one of the houses (though only some of them actually live in the house) and the houses have substantial budgets for programs and activities designed to create a social alternative to the Greek system. *Themes* is a dummy variable for the presence of theme houses on campus, another alternative to the Greek system that was created in 1985.[8] Last, *Coed* is a dummy variable for the presence of women in the student body; the college was all-male prior to 1970.[9] The bivariate correlations of these variables with *Greekmem* is shown in Table 2. All have correlations between 0.085 and 0.110 in absolute value, and all correlations are significantly different from zero at all conventional significance levels.

TABLE 2
Raw Correlations of Instruments with Greek Membership

	Themes	*Minervas*	*Coed*
Correlation σ	0.085	−0.094	−0.107
t-stat for σ = 0	3.482	−3.861	−4.371
p value	.001	.000	.000

TABLE 3
Descriptive Analysis Statistics

	All Students	**Greek**	**Non-Greek**	***t*-Stat**
collegegrade	3.151	3.050	3.287	−9.563
lnincome	11.82	11.90	11.69	5.536
age	45.794	45.873	45.688	0.313
raceblack	0.0144	0.0125	0.0169	−0.751
racehisp	0.0078	0.0062	0.0099	−0.833
raceasian	0.0072	0.0020	0.0141	−2.879
sat00	12.08	11.93	12.29	−5.517
appearance	3.447	3.520	3.347	4.600
binge	0.268	0.344	0.165	8.310
nightsdrinking	2.772	3.170	2.233	12.221
Observations	1,667	959	708	

Table 3 shows the means of the dependent and control variables for the sample as a whole and for the Greek and non-Greek subsamples. There are significant differences between fraternity members and non-Greek male students in our data sample. Greeks have lower grades, by 0.237 on the 0–4 scale; the *t*-statistic for the difference between the means is −9.563. Despite this, they have approximately 24% higher incomes; the difference in the mean of log income is 0.21 and the *t*-statistic for the difference is 5.536. Among the controls, there is no significant difference

7. We have also estimated regressions using the original 1–5 responses; they are substantially the same as those reported here, and are available from the authors on request.

8. We also have data on the number of fraternity and sorority houses, which clearly affect the chance that a student will join a fraternity, but here we do not use these as instruments due to concerns that they might be endogenous. Estimates that use them produce results quite similar to those shown here. We thank the editor for a very valuable discussion of this point.

9. We have also used the share of the student body that is female, which produces results very similar to those reported here, since it is 0 until the college goes *coed*, and after a few years is consistently close to 0.50.

in age between the groups, but there is in most of the other controls. Greeks have lower SATs by 35 points, rate themselves more attractive by 0.17 points on a 1–5 scale, are more than twice as likely to have binged in college (34.4% vs. 16.5%), and drank 0.94 more nights per week. Black and Hispanic students are less likely to be fraternity members but the difference is not statistically significant; Asian students are significantly less likely to be fraternity members.

III. METHODOLOGY

In this section of the paper, we describe the methodology used to identify the causal effect of fraternity membership on academic achievement and future income. The basic regressions we estimate are:

$$(1) \quad GPA_{it} = \beta_0 + \beta_1^* Greekmem_{it} + \beta_j^* X_{jit} + \varepsilon_{it}$$

$$(2) \quad log\left(Income_{it}\right) = \gamma_0 + \gamma_1^* Greekmem_{it} + \gamma_j^* X_{jit} + \varepsilon_{it}$$

where i indexes individuals, t indexes graduation years, and X_{ji} is a vector of individual-level characteristics affecting grades and income.

In selecting the control variables used in X_{ji}, we concentrate on those that are plausibly exogenous to fraternity membership. In particular, we do not include controls for an individual's major in the grade regressions. While prior research finds Greeks enroll in different majors than non-Greeks (e.g., Routon and Walker 2014), if choice of major is influenced by fraternity membership, it is properly considered a post-treatment variable and should be excluded from the empirical model.[10] Similarly, we do not control for industry of employment or attainment of a graduate degree in the income regressions, as these variables may in part reflect employment and educational patterns in an individual's social network and will, therefore, be endogenous to fraternity membership. Including post-treatment variables as controls in Equations (1) and (2) would tend to bias the estimated treatment effect of fraternity membership.[11]

Fraternity membership is likely to be correlated with unobserved factors that influence a student's GPA and income, because students choosing how hard to study are also choosing whether to join a fraternity, and both of these may be correlated with the student's postcollege income. As a result, least squares estimates of Equations (1) and (2) will not correctly identify the casual effect of Greek life on grades and income. They will be biased by self-selection of students with particular unobserved characteristics into the fraternity system.

To consistently estimate the causal effect of fraternities, we need instrumental variables (IVs) that are plausibly randomly assigned to students, and hence are not correlated with the error terms of Equations (1) and (2), but significantly affect decisions about joining a fraternity, and do not affect grades and postcollege income except through the student's decision to join a fraternity. The three instruments we use, indicating the presence of Minerva houses, theme houses, and female students, are all related to the residential and social choices available to students at the college. When those policies make living in a fraternity more attractive, then students are more likely to choose to do so; if there are better options for nonfraternity living, students are more likely to select those and thus less likely to join a fraternity. In addition to providing a plausible strategy for identifying the causal effect of fraternities on academic and economic outcomes, many of these variables may be considered policy instruments by college administrators. Thus, they shed light on how changes in college policies affect fraternity membership, and through membership, academic achievement and postcollege income of alumni.

10. Our results are robust to the inclusion of student majors. Regressions that control for student major decompose the fraternity effect into a portion that operates through joining the fraternity causing a change of major and a portion that operates through other channels. We have estimated our baseline models (column 2 in Tables 5 and 6) including controls for the academic division of student major (divisions are humanities, social science, physical science, and engineering; the omitted category is a cross-divisional major such as Asian Studies or environmental policy). For GPA, including these controls causes the coefficient on fraternity membership to fall from −0.259** to −0.248**. For income, the change is from 0.309** to 0.326**.

11. We do not have information on which alumni were transfer students or part-time students, both of which may affect a student's GPA. However, the share of transfers and part-time students is relatively small, and as a result, the omission of these variables is unlikely to dramatically influence our results. Private correspondence with college administrators indicates that transfer students average less than 5% of the graduating class in recent years, while the college graduates "one or two" part-time students every 5 years.

Both the Minerva house and theme house policies created new living options on campus that created competition for students with Greek houses, which may in turn have caused the Greek houses to change the living standards they offered. Our variables only indicate whether these housing options existed during a student's time at the college—they do not depend on whether the student participated in a theme house or a Minerva house. As more living options, and more competition between different living options, makes Greek membership more or less attractive, we can use the changes to identify the effect of Greek membership on grades and postcollege incomes.

These variables are plausibly randomly assigned to students as long as these policy changes did not significantly change the academic caliber or earnings potential of the students attending the college. Neither policy was directly linked to the academic program of the college, nor were they intended to affect recruiting of students. Both were designed to alter the student living experience. Although the changes in its social and residential options might have affected the ability of the college to recruit strong applicants, these policies were also quite unpopular with alumni and existing Greek students, which might have reduced the college's ability to attract applicants. We believe that these two effects approximately offset one another and that these policies did not significantly alter the quality of the student body. It is therefore appropriate to assume that the *Themes* and *Minervas* variables are uncorrelated with the error terms of Equations (1) and (2).

Our third instrument is *Coed*, indicating whether the college is coeducational. It has always been the case that one function of fraternities is to provide opportunities for men and women to meet. In the all-male era of the college's history, fraternities organized a number of events at which male students could meet women from other colleges or from the local area. Once there were women in the student body, fraternities became a much less important channel for social mingling of the genders, and this may have reduced the interest of students in joining them. However, there are reasons to be concerned that going coed might have altered the quality of the student body, causing *Coed* to be correlated with the errors of Equations (1) and (2). Since the decision by male students about where to apply to college might have depended on whether they would have female classmates, students may not be plausibly randomly assigned to the coed/noncoed condition. We do not think this is a major problem, because many single-gender schools were going coed at about the same time as the school that provides our data. In particular, a nearby women's college of comparable academic stature, long known as a sister school of the school we study, went coeducational just 1 year after the school we study did. Thus, although the college gained the ability to recruit female students, it also faced more competition for male students from women's schools that had gone coeducational, and also it had lost the product differentiation of being one of a relatively small (though decreasing) number of all-male schools. Nonetheless, since this instrument has more potential for endogeneity than the other two, we include estimates for some specifications of our model in which only the first two instruments, *Minervas* and *Themes*, are used, and use those specifications to test for the endogeneity of the *Coed* instrument.

Because our instruments are measures of the college's residential and social environment, not of the characteristics of the students or the academic program, they are identical for all students in a given class at the college, but vary over time as the college varies the housing options it offers. Changes in these variables over time provide variation in student housing options that change the propensity of students to join fraternities and allow us to identify the effect of fraternity life on grades and postcollege income. Since our identification strategy relies on comparisons across cohorts, based on variation in the college's residential system, the changes in the residential system must be uncorrelated with other differences between cohorts. This implies that we cannot use cohort-level fixed effects in the analysis, as they would be perfectly collinear with the instruments.

A second concern is that our instruments may be causally related to changes in the characteristics of the student body, for example their endowments of human and social capital and their taste for Greek life, and that these changes, rather than fraternity membership, are in part responsible for the observed changes in academic and economic outcomes that we observe. We address this issue in two ways. First, the inclusion of the quadratic function of the respondent's age should capture most of the variation in slowly and continuously evolving aspects of the labor market and the

college's social and academic environment.[12] Our instruments identify the effects of fraternities on grades and income via the discontinuities created by substantial policy changes in the living environment. Our identification strategy will be effective as long as these changes have a significant impact on fraternity membership, and they are not significantly correlated with idiosyncratic shocks affecting our dependent variables across time.

Second, we control for the impact of our instruments on the composition of the student body by incorporating variables that capture key dimensions of student characteristics that might also influence grades and income levels. Changes in residential policies might influence the levels of human and social capital that enrolled students bring to the college. The controls we include for individual human capital and social capital—SAT scores and appearance—should reduce the possibility that we will attribute such effects to fraternity membership. Although our instruments could be correlated with unobserved dimensions of human and social capital, in order to undermine instrumental validity, these measures would have to be orthogonal to the measures we include. A second challenge to instrumental validity would occur if the instruments produced changes in the taste for Greek life among incoming students and if this taste were correlated with other characteristics that influence academic performance or income. While we are unable to control directly for the taste for Greek life, this characteristic is likely to be closely related to alcohol consumption. The inclusion of proxies for the frequency and intensity of drinking go a long way toward allaying concerns over instrumental validity related to this channel of influence.[13]

As noted in the introduction, fraternity membership may influence future outcomes through a number of channels, including drinking behavior and the accumulation of human and social capital. We investigate the importance of these channels by considering specifications that include controls related to student drinking behavior and, in the income equation, academic performance.[14] Since drinking behavior and grades are clearly endogenous, the coefficients on these variables should not be interpreted as representing causal effects. However, these regressions shed light on important policy questions by decomposing the effects of the Greek system into alcohol-related and nonalcohol-related channels. For example, controlling for measures of drinking behavior in Equation (1) provides information on the effect of fraternity membership on academic achievement holding student drinking behavior constant. This information might matter for college administrators interested in addressing the impact of fraternities on academic performance by implementing policies related to student alcohol use. Similarly, controlling for grades in Equation (2) provides a rough estimate of the relative importance of human and social capital channel on future income.

IV. RESULTS

To measure the causal effect of fraternity membership on grades and income, we estimate Equations (1) and (2) by two-stage least squares (2SLS). The first-stage regression is

$$(3) \qquad Greekmem_{it} = \delta_0 + \delta_j^* X_{jit} + \lambda_k^* Z_{tk} + \varepsilon_i$$

where Z is the set of variables describing residential and social offerings on campus, with k indexing the instruments, and other variables as in Equations (1) and (2). Since *Greekmem* is an indicator variable, Equation (3) can be interpreted as a linear probability model.

Results of estimating Equation (3) are shown in Table 4. The first four columns include all three instruments, while the fifth omits the *Coed* instrument. All of the instruments are significant at the 5% level, and all at the 1% level except that, when *Coed* is included, *Minervas* is significant only at the 5% level. The introduction of coeducation

12. In results not included here, we have also included the unemployment rate at the time of the student's graduation. This variable may affect choice of activities if a student anticipates an easier or more difficult job market on graduation; for example, during a recession, students may select majors that offer better chances of employment. It can also control for the possibility that job market conditions at the start of a student's career might affect the career trajectory of the student (e.g., Oreopoulos et al. 2012). However, it is not significant in any specification and its inclusion makes no substantive changes to the results presented here.

13. In addition, we do not find that our instruments predict changes in either the frequency or intensity of drinking behavior. Results available upon request.

14. We have also run specifications including controls for student major. Since students choose majors at the same time that they choose Greek membership, and the choices are possibly related, we cannot treat student major as an exogenous control, just as we cannot treating drinking behavior as one. However, including it allows us to separate the choice-of-major channel of Greek membership's effects from other channels. The controls for student major are not significant in the results and are not included in this version of the paper.

and Minerva houses both decreased fraternity membership as expected, but the introduction of theme houses increased it. This may imply that with the introduction of theme houses, fraternities responded by making their houses more attractive, or perhaps increased recruitment efforts. The effect sizes are fairly large: the Minerva system reduces the chance of Greek membership by about 13% and the theme house system increases it by nearly 25%. The partial R^2 of the three instruments is 0.04112, and the F-stat for the exclusion of the three instruments from the first stage, which is also the Cragg-Donald statistic for instrument strength, is 23.67. This is comfortably above the critical value for the test for 5% relative bias (13.91) and above the critical value of the test for 2SLS size of 10% (22.30). When only *Minervas* and *Themes* are included, the partial R^2 for the two instruments together is 0.03324, and the F-statistic for their exclusion is 28.49. The latter is well above the critical value for the test for 2SLS size of 10%, which is 19.93 (critical values for relative bias are not available with only two instruments). Thus, the instruments pass the conventional tests for instrument strength and we are not worried about weak instruments bias.

Columns 2 through 4 of Table 4 provide results for specifications that include controls for student drinking behavior and grades. These regressions correspond to the first stages of 2SLS regressions, presented below, that include those variables as controls. Controlling for these variables in the second stage regression provides valuable information about the channels through which fraternity membership affects academic and economic outcomes. Since drinking behavior and grades are highly likely to be endogenous to fraternity membership, the coefficients on these variables should not be viewed as representing causal effects. The results indicate the fraternity membership is associated with lower grades and with more frequent and heavier drinking. The effects of theme houses and *Minervas* on fraternity membership are quite similar in magnitude and significance in all four specifications. This suggests that their effects on fraternity membership are not driven primarily by any correlation with alcohol use over time. Column 5 shows results that exclude the *Coed* instrument, which is the first stage for subsequent IV regressions that exclude that variable from the instruments. Excluding it causes the Minerva variable to become significant at the 1% level but has little other effect on the results.

A. Fraternity Membership and Academic Achievement

We turn next to our main equations of interest, beginning with the effects of fraternity membership on grades. Column 1 of Table 5 shows the result of estimating Equation (1) by ordinary least squares (OLS). The least squares result suggests a negative association between grades and fraternity membership, with fraternity members having GPAs 0.213 points (on the standard 0–4 scale) below those of nonfraternity members. In addition, college grades are quadratic in age, peaking in 1991, negatively related to Black and Hispanic ethnicity, and positively related to the SAT score, though the effect is fairly small, with an additional 100 points on SATs (1,600 scale) producing only a 0.084 increase in GPA.

Column 2 shows results for the 2SLS regression in which we instrument for fraternity membership using the three instruments. Comparing our results in columns 1 and 2, we find that 2SLS estimates of the effects of fraternities on grades are fairly similar to those of OLS; fraternity membership reduces grades by 0.259 points on the 0–4 scale. The implication of this finding is that students who join fraternities have unobserved characteristics that are not particularly different from those who do not join. We conduct the Sargan test for the validity of the overidentifying restrictions and find that, conditional on at least one instrument being valid, the restrictions are acceptable with a J-statistic of 1.965 and a p value of .374. In particular, the *Coed* instrument is valid as long as at least one of the other two instruments is. The coefficients for the control variables are very similar between the OLS and 2SLS specifications.

The results provided in column 3 also provide evidence on the channels through which fraternity membership affects grades. A likely channel of influence is that fraternity membership may influence academic performance through its impact on drinking behavior. Controlling for the frequency and intensity of drinking allows us to estimate how important this channel is. Comparing our results in columns 2 and 3, we find the inclusion of the drinking variables does reduce the estimated impact of fraternity membership on grades, but only by about 10%, from −0.259 to −0.236. This implies that the alcohol channel plays a relatively small role in the effect of fraternity membership on academic performance. It also offers evidence that unobserved changes in the taste for Greek life among the student body is not biasing our estimate of the effects of

TABLE 4
Determinants of Fraternity Membership

Variables	(1) greekmem	(2) greekmem	(3) greekmem	(4) greekmem	(5) greekmem
themes	0.228***	0.241***	0.228***	0.240***	0.295***
	(4.407)	(4.877)	(4.503)	(4.908)	(6.064)
Minervas	−0.138**	−0.128**	−0.130**	−0.124**	−0.178***
	(−2.081)	(−2.016)	(−1.994)	(−1.971)	(−2.708)
coed	−0.233***	−0.224***	−0.207***	−0.209***	
	(−3.689)	(−3.725)	(−3.338)	(−3.489)	
age	0.0224*	0.00798	0.0248**	0.0107	−0.00575
	(1.745)	(0.646)	(1.973)	(0.873)	(−0.555)
age2	−0.000199	9.26e-06	−0.000228	−2.89e-05	0.000183*
	(−1.336)	(0.0646)	(−1.566)	(−0.203)	(1.704)
raceblack	−0.158	−0.0446	−0.200**	−0.0845	−0.166*
	(−1.589)	(−0.470)	(−2.058)	(−0.895)	(−1.665)
racehisp	−0.121	−0.0327	−0.169	−0.0748	−0.125
	(−0.908)	(−0.256)	(−1.292)	(−0.590)	(−0.929)
raceasian	−0.443***	−0.295**	−0.429***	−0.303**	−0.442***
	(−3.196)	(−2.224)	(−3.159)	(−2.307)	(−3.179)
sat00	−0.0400***	−0.0369***	−0.0223**	−0.0259***	−0.0431***
	(−4.249)	(−4.109)	(−2.359)	(−2.839)	(−4.576)
appearance	0.0682***	0.0499***	0.0695***	0.0528***	0.0709***
	(4.374)	(3.340)	(4.549)	(3.561)	(4.534)
nightsdrinking		0.0816***		0.0741***	
		(9.790)		(8.835)	
binge		0.0840***		0.0635**	
		(2.707)		(2.049)	
collegegrade			−0.194***	−0.126***	
			(−8.414)	(−5.422)	
Constant	0.360	0.313	0.686**	0.541*	0.592**
	(1.173)	(1.065)	(2.265)	(1.836)	(1.966)
Observations	1,667	1,667	1,667	1,667	1,667
R^2	0.077	0.162	0.115	0.176	0.069

Note: Robust *t*-statistics in parentheses.
***$p < .01$; **$p < .05$; *$p < .1$.

Greek membership on grades.[15] Fraternity members may drink more than the average student, with negative results on their academic performance; our estimates suggest that most of this effect is because hard-drinking students select into fraternities, rather than because fraternities significantly increase drinking in the marginal member. Most of the reduction in grades that is caused by joining a fraternity appears to operate through other channels, such as possible negative attitudes toward academic work in the house or an emphasis on using time to develop social capital through organizing house activities and building a network of relationships within the house. This implies that attempts by college administrators to improve academic performance in Greek houses should go beyond attempts to reduce alcohol consumption in the house; other factors are substantially more important.

Column 4 shows the result of estimating the model using only *Minervas* and *Themes* as instruments. The estimated effect of Greek membership on grades is now −0.183 points. This estimate is not statistically significantly different from zero; with one less instrument, the estimation is not as powerful and the standard errors of the estimates higher. However, the results are otherwise quite comparable to both the IV estimates with all three instruments, and to the OLS results. The *C*-test statistic for the endogeneity of *Coed* in this model is 1.665 with a *p* value of .197, which further suggests that treating *Coed* as an exogenous instrument to get more estimating power is acceptable.

15. In a related note, we do not find that our instruments predict changes in drinking behavior among students in the sample. Results available on request.

TABLE 5
Fraternity Membership and Grades

Variables	(1) OLS	(2) IV	(3) IV	(4) IV
greekmem	−0.213***	−0.259**	−0.236**	−0.183
	(−8.536)	(−2.139)	(−2.003)	(−1.359)
age	0.0241***	0.0240***	0.0300***	0.0241***
	(2.862)	(2.931)	(3.562)	(2.946)
age2	−0.000308***	−0.000306***	−0.000408***	−0.000309***
	(−3.270)	(−3.332)	(−4.244)	(−3.363)
raceblack	−0.253***	−0.261**	−0.328***	−0.248**
	(−3.353)	(−2.530)	(−3.305)	(−2.391)
racehisp	−0.272**	−0.279**	−0.344***	−0.267*
	(−2.360)	(−2.029)	(−2.579)	(−1.940)
raceasian	−0.0248	−0.0437	−0.138	−0.0122
	(−0.142)	(−0.292)	(−0.972)	(−0.0802)
sat00	0.0835***	0.0811***	0.0790***	0.0851***
	(7.863)	(7.091)	(7.216)	(7.185)
appearance	0.0200	0.0231	0.0337**	0.0179
	(1.093)	(1.291)	(2.023)	(0.976)
binge			−0.143***	
			(−4.138)	
nightsdrinking			−0.0411***	
			(−3.245)	
Constant	1.789***	1.833***	1.917***	1.760***
	(6.632)	(7.062)	(7.526)	(6.623)
Observations	1,667	1,667	1,667	1,667
R^2	0.106	0.104	0.147	0.105
Overid p value		0.374	0.415	0.583
First stage F-stat		23.67	26.12	28.49

Notes: z-statistics in parentheses. Estimates are from IV regressions treating Greek membership as endogenous. Columns 2–3: The excluded instruments are *Minervas*, *themes*, and *coed*. Column 4: the excluded instruments are *Minervas* and *themes* only.
***$p < .01$; **$p < .05$; *$p < .1$.

B. Fraternity Membership and Income Levels

Next we turn to the effects of fraternity membership on postcollege incomes. Column 1 of Table 6 shows the result of estimating Equation (2) by OLS. It suggests that fraternity members have $exp(0.183)-1 = 20.1\%$ higher incomes than nonmembers. Other coefficients take expected signs. Income rises with age at a decreasing rate and is predicted to peak at 52.9 years of age. African American students have significantly lower incomes, and Asian students have higher incomes, though the latter effect is significant only at the 10% level. Several explanations of these results are possible, including discrimination in labor markets and differences in choice of major and classes. SAT scores have no effect on postcollege income, but college appearance does, with a 1-point increase in self-reported attractiveness increasing wages by 12.3%.

Columns 2–5 present results from the 2SLS regression using all three instruments. Column 2 indicates that Greek membership increases future income by $exp.(0.309)-1 = 36.2\%$. This effect is almost twice as large as the OLS estimate, suggesting that OLS estimates of the effect of fraternity membership on grades are biased downward due to conscious selection of students with higher income-earning potential (but not higher academic potential) into fraternities. This estimate implies that the formation of social capital that takes place in fraternities is much more than sufficient to overcome the loss of human capital from reduced studying, as reflected in poorer grades.

This finding may seem counterintuitively large, particularly if one believes the stereotype that fraternity membership is more attractive to students with lower academic standards, since this regression does not control for (endogenous) GPAs. However, the existing literature suggests

TABLE 6
Fraternity Membership and Income

Variables	(1) OLS	(2 IV	(3) IV	(4) IV	(5) IV	(6) IV
greekmem	0.183***	0.309**	0.328**	0.384**	0.403**	0.397**
	(5.826)	(1.976)	(2.098)	(2.369)	(2.549)	(2.261)
age	0.179***	0.179***	0.174***	0.173***	0.164***	0.179***
	(14.51)	(16.94)	(15.55)	(16.52)	(15.10)	(16.80)
age2	−0.00169***	−0.00169***	−0.00163***	−0.00161***	−0.00150***	−0.00170***
	(−12.08)	(−14.25)	(−12.76)	(−13.73)	(−12.13)	(−14.15)
raceblack	−0.275***	−0.253*	−0.223*	−0.181	−0.122	−0.238*
	(−3.178)	(−1.900)	(−1.699)	(−1.359)	(−0.941)	(−1.760)
racehisp	−0.114	−0.0939	−0.0777	−0.0170	0.0282	−0.0802
	(−0.611)	(−0.528)	(−0.440)	(−0.0963)	(0.162)	(−0.446)
raceasian	0.249*	0.301	0.337*	0.315*	0.381**	0.338*
	(1.951)	(1.556)	(1.796)	(1.650)	(2.056)	(1.706)
sat00	0.0153	0.0220	0.0228	5.74e-05	−0.00131	0.0266*
	(1.357)	(1.484)	(1.574)	(0.00424)	(−0.0959)	(1.720)
appearance	0.116***	0.108***	0.102***	0.101***	0.0917***	0.102***
	(6.215)	(4.642)	(4.626)	(4.359)	(4.176)	(4.238)
binge			−0.0378		0.00573	
			(−0.828)		(0.130)	
nightsdrinking			0.0263		0.0388**	
			(1.567)		(2.429)	
collegegrade				0.273***	0.307***	
				(6.069)	(8.043)	
Constant	6.707***	6.585***	6.631***	6.080***	6.039***	6.500***
	(22.02)	(19.61)	(19.64)	(16.66)	(17.01)	(18.74)
Observations	1,667	1,667	1,667	1,667	1,667	1,667
R^2	0.318	0.312	0.312	0.334	0.337	0.299
Overid *p* value		0.506	0.473	0.668	0.644	0.863
First stage *F*-stat		23.67	26.12	22.22	24.96	28.49

Notes: z-statistics in parentheses. Estimates are from IV regressions treating Greek membership as endogenous. Columns 2–5: The excluded instruments are *Minervas*, *themes*, and *coed*. Column 6: The excluded instruments are *Minervas* and *themes* only.
***$p < .01$; **$p < .05$; *$p < .1$.

the effect of social capital on individual income may be substantial.[16] In addition, it is important to recall that 2SLS estimate measures the local average treatment effect (LATE). That is, it measures the effect of fraternity membership on the academic performance of marginal fraternity members, who sort into or out of fraternity membership based on changes in the IVs. Our findings suggest that fraternity membership matters more for the future incomes of marginal fraternity members, whose membership decisions are influenced by changes in college living options, than it does for individuals whose membership decision is relatively unaffected by such changes. A plausible explanation for this outcome is that fraternity membership has a larger impact on social capital formation for marginal members than it has for inframarginal members. While fraternity membership may affect the academic performance of marginal and inframarginal members differently, we believe that the impact on marginal fraternity members is the relevant measure for thinking about college policies, since these students are the most likely to be sorted into and out of fraternity membership by changes in the regulation of Greek organizations. Other results of the estimation differ little between the OLS and 2SLS specifications. The Sargan test for the validity of the overidentifying restrictions has a *J*-statistic of 1.361 and a *p* value of .506.

Columns 3, 4, and 5 of Table 6 show the effects of re-estimating Equation (2) including controls for collegiate drinking behavior, for grades, and for both. This allows us to decompose the effects of fraternity membership on

16. For example, Matsunaga (2015) finds that each one-unit increase in an individual's social network (measured 0–6) is associated with a 7% increase in income, while a one-unit increase in a two-unit measure of trust increases income by 11%.

income into an alcohol channel, a human capital channel, and all other channels, which we expect primarily to reflect social capital accumulation. The results in column 3 show that controlling for collegiate drinking behavior has little effect on our estimate of the effect of fraternity membership on future income. This implies that the social capital formation that takes place in fraternities is not much affected by the amount of drinking a student does. In addition, neither collegiate drinking variable is significantly associated with future income. The robustness of our results to inclusion of the two alcohol consumption variables reduces concern that changes in the interest in Greek life in the student body undermine the validity of our instruments.

In contrast, a student's GPA does affect their future income, and holding grades constant affects our estimate of the effect of Greek membership on income. Column 4 of Table 6 shows that, when grades are held constant (that is, we compare two students with the same GPA, one of whom chose to join a fraternity and one of whom did not), fraternity membership increases future income by $exp(0.384)-1=46.8\%$, an effect we attribute primarily to social capital accumulation. Comparing results for columns 2 and 4, we find that the human capital channel accounts for an 10.6% decline in future income, indicating that the social capital channel is considerably more important than the human capital channel for future income. This is why fraternity members earn higher incomes despite the harmful effects of fraternity membership on their grades.

Column 5 of Table 6 includes both the drinking behavior and GPA controls. The estimated effect of fraternity membership in this specification is much the same as the result in column 3, and again suggests that the social capital formation effects of fraternities are not dependent on the amount of drinking that takes place in them. Our results for this specification show that frequent drinking is associated with higher future income; this could indicate that frequency (but not intensity) of drinking is associated with higher social capital formation for Greeks and non-Greeks alike. However, it cannot be given a causal interpretation due to the endogeneity of drinking behavior. It may be that students who have more social capital choose to drink more frequently, but the drinking itself has no effect on their postcollege incomes.

Column 6 of Table 6 shows estimates that do not use *Coed* as an instrument. The results are not qualitatively different from the ones that do use that instrument; the results are quite robust to the inclusion or exclusion of this instrument. The estimates using only two instruments are somewhat less precise than those that use all three. They show a somewhat larger, and still statistically significant, effect of fraternity membership on income. Other results are nearly identical to those found in Table 6. The test for exogeneity of *Coed* in the column 2 regression (no drinking or grade controls) has a *C*-test statistic of 1.331 with a probability value of .249, again confirming that the models that treat *Coed* as an exogenous instrument are acceptable, though the results are quite robust to the inclusion or exclusion of this instrument.

V. CONCLUSION

This paper identifies the academic and economic consequences of fraternity membership using data from a survey of the alumni of a small Northeastern college that spans over 40 years of graduates. We identify the causal effect of fraternity membership by instrumenting with three changes to the college's residential and social environment over this timespan: the introduction of coeducation, theme houses, and the Minerva houses, a set of non-Greek social houses intended to provide a wider range of social alternatives to students. We find that the probability of fraternity membership decreases with the introduction of coeducation and the Minerva houses, but increases with the introduction of theme houses.

We find that for marginal members whose decision to join a fraternity is dependent on these policy changes, membership lowers grades by about 0.25 points on the traditional 4-point scale. Controlling for alcohol-related behavior reduces this estimate, but only very slightly—by about 0.02 points. This suggests that, despite its visibility, alcohol consumption plays a relatively minor role in the reduced academic achievement of fraternity members. This finding implies limits to the ability of alcohol-related policies to address the academic impact of fraternities. We also find that fraternity membership has a large positive impact on future income levels, increasing it by approximately 36%. Thus, it appears that the negative impact of fraternity membership on human capital accumulation is more than offset by its effect on the formation of social capital. Because our data are collected from workers from ages 25 to 65, they incorporate the effect of Greek membership on lifetime earnings, not just on earnings in the first job after college.

In interpreting these results, we stress that 2SLS estimates reflect the LATE. That is, they reflect the effect of fraternity membership on marginal fraternity members, whose membership decision is influenced by changes in residential options at the college, rather than the effects on those students who will join fraternities in any event. This may differ from the average effect of fraternity membership if the marginal and average members respond to membership differently. In particular, marginal members may be less capable of balancing their academic lives and the demands of fraternity social life. However, the large impact of fraternity membership in future income suggests that marginal members may experience large gains in terms of social capital and relationships. In addition, our estimates pertain to the effects of fraternity membership at a single college with a long history of fraternity life on campus, and may not generalize to other schools with different histories or social environments. That said, we find no reason to believe that the trade-off between human and social capital accumulation that we identify would be qualitatively different at other institutions.

Taken together, our estimates suggest that academic policymakers face a significant trade-off when designing policies that affect the prevalence of Greek organizations on campus. Limiting Greek life may increase academic achievement, particularly by reducing fraternity membership, but these academic gains will tend to come at a relatively large cost in terms of alumni incomes. Of course, the presence of Greek organizations may also influence campus culture in important ways not considered here. For example, the exclusive nature of Greek organizations may work against creating a culture of inclusion, and fraternities may also contribute to a climate that encourages undesirable sexual behavior and norms (Routon and Walker 2016). In addition, from a broader social perspective, some of the income gains to fraternity members may represent redistribution to fraternity members from nonmembers, rather than increased productivity. For this reason, the private gains to fraternity members do not imply that fraternity membership is Pareto improving. Academic administrators may wish to consider these and other factors, together with the effects of fraternities on grades and future incomes of alumni, in determining the appropriate extent of a Greek system on campus.

REFERENCES

Alva, S. A. "Self-Reported Alcohol Use of College Fraternity and Sorority Members." *Journal of College Student Development*, 39, 1998, 3–10.

Cashin, J. R., C. A. Presley, and P. W. Meilman. "Alcohol Use in the Greek System: Follow the Leader?" *Journal of Studies on Alcohol*, 59, 1998, 63–70.

Chaloupka, F. J., and H. Wechsler. "Binge Drinking in College: The Impact of Price, Availability, and Alcohol Control Policies." *Contemporary Economic Policy*, 14, 1996, 112–24.

DeSimone, J. "Fraternity Membership and Binge Drinking." *Journal of Health Economics*, 26, 2007, 950–67.

———. "Fraternity Membership and Drinking Behavior." *Economic Inquiry*, 47(2), 2009, 337–50.

Glaeser, E. L., D. I. Laibson, and J. A. Scheinkman. "Measuring Trust." *Quarterly Journal of Economics*, 115(3), 2000, 811–46.

Grubb, F. "Does Going Greek Impair Undergraduate Academic Performance? A Case Study." *American Journal of Economics and Sociology*, 65(5), 2006, 1085–110.

Guiso, L., P. Sapienza, and L. Zingales. "The Role of Social Capital in Financial Development." *American Economic Review*, 94(3), 2004, 526–56.

Hamermesh, D. S., and J. E. Biddle. "Beauty and the Labor Market." *American Economic Review*, 84(5), 1994, 1174–94.

Marmaros, D., and B. Sacerdote. "Peer and Social Networks in Job Search." *European Economic Review*, 46, 2002, 870–79.

Matsunaga, Y. "Salary Commensurate with Social Capital." *Applied Economics Letters*, 22(4), 2015, 1116–21.

Oreopoulos, P., T. v. Wachter, and A. Heisz. "The Short- and Long-Term Career Effects of Graduating in a Recession." *American Economic Journal: Applied Economics*, 4(1), 2012, 1–29.

Popov, S. V., and D. Bernhardt. "Fraternities and Labor-Market Outcomes." *American Economic Journal: Microeconomics*, 4(1), 2012, 116–41.

Routon, W., and J. Walker. "The Impact of Greek Organization Membership on Collegiate Outcomes: Evidence from a National Survey." *Journal of Behavioral and Experimental Economics*, 49, 2014, 63–70.

———. "Attitude Changes and Self-Perceived Skill Gains from Collegiate Greek Organization Membership." *Social Science Quarterly*, 97(3), 2016, 807–22.

Sacerdote, B. "Peer Effects with Random Assignment: Results for Dartmouth Roommates." *Quarterly Journal of Economics*, 116, 2001, 681–704.