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Greek Organization Membership and Collegiate Outcomes at an Elite, Private University

Jay K. Walker · Nathan D. Martin · Andrew Hussey

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Abstract In this study, we use detailed survey and institutional data from a prospective panel study of students attending a highly selective, private university to examine the effects of fraternity or sorority membership on a range of collegiate outcomes. Previous research has given insufficient attention to selection issues inherent in the study of voluntary associations, and thus prior work likely overstates the impact of Greek membership. We use propensity score matching methods to isolate a more appropriate counterfactual or control group and to provide a more rigorous test of the effects of being a Greek member. Among our primary results, we find that fraternity and sorority members are more likely to be white, have more advantaged social origins, and arrive on campus placing greater emphasis on maintaining an active social life in comparison to students who do not join Greek organizations. Although Greeks assign greater importance to being a social person and report a more prominent role of alcohol and drugs in their enjoyment of campus life than do non-Greeks, these differences are attributable to pre-treatment characteristics. After accounting for selection effects, we find that Greek membership leads to higher levels of involvement in and satisfaction with campus social life, and predicts higher graduation rates and degree persistence.

Keywords Achievement · Elite education · Fraternities and sororities · Selection effects · Student involvement

Jay K. Walker and Nathan D. Martin contributed equally to this study.

J. K. Walker
Department of Economics and Finance, Niagara University, Lewiston, NY, USA

N. D. Martin (✉)
School of Social Transformation, Arizona State University, Tempe, AZ 85287-6403, USA
e-mail: ndm@asu.edu

A. Hussey
Department of Economics, University of Memphis, Memphis, TN, USA

Introduction

Social fraternities and sororities are a highly visible but controversial part of college life and a key part of the undergraduate experience for many students. Currently there are approximately 750,000 current members and 9 million living alumni of 14,000 chapters of national Greek-letter organizations [North-American Interfraternity Conference (NAIC) 2013; National Panhellenic Conference (NPC) 2013; National Pan-Hellenic Council (NPHC) 2013], in addition to local or regional organizations and secret clubs. At Duke University, the focus of the current study, about one-third of undergraduate students are affiliated with the 42 fraternities and sororities on campus. Popular stereotypes connect Greek membership to a hedonistic subculture characterized by alcohol abuse, raucous partying and the objectification of women (DeSantis 2007; Grigsby 2009; Sanday 2007), while incidents and allegations of hazing, sexual assault and racial insensitivity regularly appear in headlines of national media outlets (e.g., Kaminer 2013; Kingkade 2013; Zucchino 2013). These issues raise important questions about how fraternities or sororities contribute to the goals of institutions of higher learning, but there remains a limited understanding of the effects of Greek membership across the college years (Molasso 2005).

Previous studies of how Greek membership affects academic performance and other collegiate outcomes suggest that involvement can both encourage and discourage student success. On the one hand, Greek membership entails a sizeable time investment and could lead to behaviors that distract from coursework. Further, fraternities and sororities tend to be homogenous social groups, limiting opportunities to engage with students from different backgrounds or to benefit from diverse learning environments (e.g., Nelson Laird 2005). On the other hand, membership in Greek organizations could provide students with access to supportive social networks, personal contacts, information and other resources. Campus officials routinely monitor the academic performance of individual fraternities or sororities, providing incentives for Greek members to maintain high grades. Additionally, fraternity or sorority membership predicts higher levels of involvement in campus life (Pike 2000, 2003), which in turn is linked to higher grades and greater satisfaction with the college experience (Astin 1999).

With few exceptions, the existing literature of Greek organization membership and student outcomes has relied on convenience samples and cross-sectional survey data. As a result, it is likely that previous studies confound the effects of membership with the effects of factors predictive of the decision (and invitation) to join a fraternity or sorority. To address the possibility of selection effects, we use propensity score matching methods to model the determinants of Greek membership and to establish a relevant control group of non-Greek members. Our data are from a prospective panel study of students attending a highly selective, private university that includes survey waves conducted before and after Greek recruitment and initiation. We benefit from access to students' institutional records and a wider range of control variables than is typically found in the research literature, and we are able to consider a broad set of collegiate outcomes, including academic, behavioral, attitudinal and time-use variables.

In the sections to follow, we review previous studies of effects of Greek membership on student outcomes and our study design. We observe large differences between Greek members and non-members that generally conform to popular stereotypes. However, most of these differences are attributable to pre-college factors or selection effects. Not only do fraternity and sorority members have relatively advantaged social origins but also they arrive on campus placing greater emphasis on maintaining an active social life. After implementing matching methods, there is little evidence that participation in Greek

organizations leads students to assign greater prominence to alcohol or drugs in their enjoyment of campus life or to place greater value on being a social person. Yet, we do find that Greek membership leads to higher graduation rates and greater satisfaction with campus social life during the college career.

Greek Membership and Student Outcomes

Selection or Socialization?

Consideration of how fraternities and sororities contribute to college student development or reflect the goals and missions of institutions of higher learning must contend with the twin processes of selection and socialization. We conceptualize Greek membership as a three-stage process to distinguish: (a) the antecedents to joining a fraternity or sorority, (b) the experiences, activities and resources associated with membership, and (c) the academic and social consequences for members (cf. Pike 2000). Within this framework, we seek to isolate factors that encourage selection into a Greek organization—including family background, high school experiences, academic preparation, social identities and future aspirations—from the effects of membership on involvement with campus life, academic performance, post-graduation plans and other college outcomes.

It is reasonable to expect Greek membership to be associated with a mix of desirable and undesirable outcomes across the college years. Greek organizations could provide members with social capital and other resources that facilitate success in the classroom and future careers (Hu and Wolniak 2010). In addition to opportunities to develop leadership skills and participate in service and philanthropic activities, fraternity or sorority membership promises a supportive peer community and access to alumni and affiliate networks. On many campuses, such as the focus of the present study, Greek life has a prominent place on campus, including exclusive on-campus housing, a formal administrative division and governing councils. An extensive literature underscores the benefits of campus involvement for student development, including higher grades and greater satisfaction with the college experience (Pascarella and Terenzini 2005). In addition to promoting campus involvement and a full social calendar, Greek membership could provide useful information channels and encouragement to achieve personal goals.

Alternatively, to the extent that Greek organizations support a campus subculture that places an active social life ahead of intellectual pursuits, membership could promote attitudes and behaviors at odds with other university aims and objectives. While rituals and traditions help foster intragroup trust and solidarity (Coleman 1987), strong group allegiances can reinforce social divisions, foster intergroup tension and prevent the exchange of new ideas and perspectives (Portes and Landolt 1996). The substantial time commitment and frequent organized activities associated with Greek membership could interfere with studying and coursework, stifle forms of individual expression and block opportunities to realize the full academic benefits of a diverse student body.

However, a further possibility is that any observed differences between Greek members and non-members is not due to membership per se, but instead reflects the process of selection into organizations. Simply put, a campus subculture linked by a shared inclination towards maintaining an active social life does not require a formal system of recruitment and membership to have enduring popularity. As Wilder et al. (1997, p. 152) note, undesirable consequences of Greek membership attributable to selection raise questions about university admission and recruitment policies, while differences between

Greek members and non-members attributable to socialization processes and exogenous factors can inform campus interventions and adjustments to student life policies and programming.

Reflecting this conceptual uncertainty, research to date has yielded mixed and ambiguous results concerning the effects of fraternity or sorority membership on student outcomes. Previous studies find that Greek membership is associated with attitudes and behaviors that discourage academic success or conflict with university values. Fraternity or sorority membership is associated with a greater likelihood of engaging in risky behaviors—including binge drinking (Wechsler et al. 1996), pathological gambling (Rockey et al. 2005) and abuse of prescription stimulants (Aikins 2011)—and academic dishonesty (McCabe and Trevino 1997; Passow et al. 2006; Williams and Janosik 2007). There is considerable evidence that involvement with Greek organizations has a negative influence on members' openness to diversity and acceptance of people from different backgrounds (Pascarella and Terenzini 2005, p. 617). Compared to non-members, Greeks are less likely to have interracial peer interactions and friends on campus (Antonio 2001; Stearns et al. 2009), and are less tolerant of different viewpoints (Nelson Laird 2005).

Other studies show that participation in Greek organizations can promote active student engagement and involvement in campus life. Fraternity or sorority membership is associated with higher levels of self-reported academic effort, self-efficacy and personal growth (Hayek et al. 2002; Thompson et al. 2011), social involvement and interpersonal skills (Pike 2000, 2003; Pike and Askew 1990), and commitment to civic engagement (Astin 1993; Pascarella and Terenzini 2005). Black Greek-letter organizations, in particular, can provide members with opportunities to develop leadership skills and access to helpful social networks (Kimbrough and Hutcheson 1998; McClure 2006). Consistent with the view that student satisfaction is a function of active involvement in campus life (Astin 1999), fraternity or sorority members report higher levels of satisfaction with the undergraduate experience in comparison to non-members (Charles et al. 2009; Nathan 2005).

The relatively few studies that have examined effects of Greek involvement on academic skills and performance suggest a weak, negative relationship (e.g., Gellin 2003; Grubb 2006), although evidence is mixed. Studies based on national or multi-institutional samples find that fraternity or sorority membership has a significant, negative effect on GRE scores and college grades (Anaya 1999; Routon and Walker 2014) and critical thinking test scores (Arum and Roksa 2011, pp. 204–206). Routon and Walker (2014) argue that these academic performance gaps are due to differences in time allocation, as Greek members tend to spend fewer hours studying per week. Additionally, Greek membership has a negative effect on test scores in reading, math and critical thinking for first year students (Pascarella et al. 1996), but by the third year these gaps have largely disappeared (Pascarella et al. 2001). In a study of students at 28 selective colleges and universities, Charles et al. (2009, pp. 94–95) find a significant, negative effect of living in a Greek house on college grades but no effect of Greek membership. Martin et al. (2011), in a study of first year students at 11 liberal arts colleges, find no significant association between Greek involvement and critical thinking skills, attitudes toward learning and other student development outcomes.

The Present Study

The history of Greek-letter organizations is most intensive at elite institutions and among high status groups. The oldest Greek-letter organization, Phi Beta Kappa, was founded in 1776 by students at the College of William and Mary as a secret club and space for

socializing and debate (Current 1990). Over time, the mission of fraternities and sororities evolved to emphasize fellowship and charity among members and service to the community (NAIC 2013; NPC 2013). Yet, throughout much of the nineteenth- and twentieth-centuries, Greek-letter organizations also served as enclaves for the wealthy, powerful and well-connected (Bowen et al. 2005; Horowitz 1987). Elite universities have long sustained a "collegial lifestyle… firmly fixed in the fraternity or sorority system" that emphasizes an active social life at least as much as success in the classroom (Ellis et al. 1971, p. 28). Although members of fraternities and other exclusive social clubs earned a reputation for middling work in the classroom (Karabel 2005), they also gained access to high-status and influential social networks that consolidated power and control (Domhoff 2005; Mills 1956 [2000]; Robbins 2002). Collectively, Greek organizations count as alumni 39 current Senators, 19 US Presidents, nearly one-third of all US Supreme Court Justices, and half of the Top 10 Fortune 500 CEOs (NAIC 2013).

By the early-twentieth century, this ideal of a "well-rounded" and "collegial" student factored into assessments of applicants' character and leadership potential to provide a mechanism to admit desired candidates with unimpressive grades or test scores, and vice versa. Selective institutions redesigned admissions programs to protect the established Protestant elite's advantage in the wake of increasing competition from rising social groups, including the adoption of preferences for children of alumni (i.e., legacies) and restrictive quotas to limit the number of Jewish students on campus (Bowen et al. 2005; Karabel 2005). Upon matriculation, minority groups regularly encountered a mix of informal agreements and explicit restrictions to block access to fraternities and sororities on the basis on racial/ethnic, class and religious background (Hughey 2013; Syrett 2009).

Still today, "fraternity and sorority recruitment is perhaps the most formalized and explicit version of social evaluation and exclusion on campuses" (Stevens et al. 2008, p. 133). At selective colleges and universities, the same general criteria and method for evaluating prospective students has persisted for nearly a century (Stevens 2007). Similarly, fraternities and sororities continue to express their dominant class origins, and current memberships reflect student bodies of an earlier, less inclusive era (Stuber 2009). Compared to non-members, Greek members are more likely to be white and to have upper- or upper-middle class backgrounds (Charles et al. 2009; Martin 2012; Stearns et al. 2009; Stuber et al. 2011).

Greek organizations tend to occupy a more visible role at elite and highly selective institutions, although in a few prominent cases fraternities and sororities have been abolished or banned from campus (e.g., Princeton, Rice). At national 4-year colleges and universities, about 12 % of entering freshmen expect to join a fraternity or sorority during the college years, compared to 17 % of students at highly selective, private universities (Pryor et al. 2012). Recent estimates of Greek membership during the college years based on responses to multi-institutional surveys range from about 11 to 18 % of students (Franke et al. 2010; Kuh et al. 2004). As noted above, about 34 % of the Duke students in this study are fraternity or sorority members, a figure slightly higher than the typical highly selective college and university. For example, among schools in the top 25 of the US News & World Report (2014) college rankings, the average school reports about 23 % of students being fraternity or sorority members.

Estimating Treatment Effects

A central problem in attempting to estimate causal effects of associational membership is that individuals select (or are selected) into groups. It is likely that different groups on

campus attract students with similar goals and backgrounds, which would confound the "true" effects of group involvement. Thus, observed differences by group membership could be due to individual predispositions or the result of interactions with others (Manski 1993). For example, Sacerdote (2001, p. 699) finds that students are more likely to join a fraternity or sorority if they or their dorm-mates reported drinking alcohol during high school, and if they had a (randomly-assigned) roommate who also joined a Greek organization. In attempting to quantify the causal effects of membership, it is therefore important to control for factors that may influence both the decision to join and subsequent outcomes.

Previous studies of the effects of Greek membership on college outcomes have adopted study designs that are susceptible to endogeneity bias, including the use of cross-sectional or convenience samples (e.g., Grubb 2006; Nelson Laird 2005; Pike 2000; Thompson et al. 2011) or limited panel designs that include only one in-college wave (e.g., Antonio 2001; Stearns et al. 2009). Recent analyses of large, multi-institutional datasets incorporate hierarchical models to consider both individual- and school-level effects on college outcomes (e.g., Hayek et al. 2002; Martin et al. 2011; Pike 2003), providing more accurate estimates and predictions in comparison to traditional regression analysis (Gelman and Hill 2006). However, we are aware of only two studies (Pascarella et al. 2001; Routon and Walker 2014) in which information on Greek membership was collected at an earlier point in time from in-college variables. Within the limits of observational data, an ideal dataset would include a large number of variables observed prior to membership and additional waves of data collection after a membership decision is made in order to minimize the risk of selection bias and to better estimate causal effects.

In the section to follow, we describe our data source and analytic strategy. First, we model selection into Greek organizations and examine how factors highlighted by previous studies are associated with a student's propensity to join a fraternity or sorority. More specifically, we model the probability of becoming a Greek member as a function of a student's socioeconomic background, including race/ethnicity, parent's education, pre-college household income and access to social resources, such as a stable home environment and family ties and connections, as well personal identities, high school participation and priorities for the college years. As a limitation, we lack information of actual alcohol and drug use, both prior to matriculation and across college years (cf. Sacerdote 2001); however, we are able to consider a variety of factors highlighted by previous studies as significant predictors of fraternity or sorority membership. Reflecting the historical legacy of Greek organizations at elite universities, prospective Greek members are expected to have advantaged social origins and prioritize social and extracurricular involvement over being a good student. Next, we consider how fraternity or sorority membership is associated with a range of campus experiences and collegiate outcomes by comparing Greek members to non-members who are similar on pre-college variables.

Data and Methods

Study Design

This study uses data from the Campus Life and Learning (CLL) project, a prospective panel study of students at Duke University in Durham, North Carolina (Spenner et al. 2005). The CLL followed students in the entering 2001 and 2002 cohorts (graduating classes of 2005 and 2006) across the college career with four survey waves, administered

in the summer prior to matriculation and in the spring of the first, second and fourth college years. Importantly, the CLL was not intended to be representative of all postsecondary institutions. Although more selective than most colleges or universities, Duke is similar to other elite private and many highly-rated public universities in terms of admissions rate and yield, cost of attendance, student–faculty ratio and student retention rate, as well as on a range of student characteristics, including SAT scores, family background and immediate post-graduation plans.

Among all incoming students in the two CLL cohorts (N = 3,254), about 60 % were white, 11 % were black, 8 % were Hispanic, 15 % were Asian, and 7 % were multiracial or some other race. The CLL design randomly selected one-third of white students, two-thirds of Asian students and one-third of multiracial students in each cohort, as well as all black and Hispanic students. The analysis to follow incorporates sampling weights to reflect the study design. The full sample included 1,533 students, and 77 % of sample members completed the pre-college survey (n = 1,181). Of these pre-college respondents, 77 % also responded to the first year survey (n = 910), 75 % to the second year survey (n = 891), and 67 % to the fourth year survey (n = 793). For this study, the baseline analytic sample includes students who completed the pre-college survey and excludes one case that was missing on key demographic variables (n = 1,180). Information from institutional records, including admissions committee evaluations and official grade transcripts, is available for all students in this study. Detailed tests for possible bias due to student attrition or non-response strongly suggest that the effects are small and sporadic (Martin and Spenner 2009, p. 646).

Variables

Appendix 1 contains measurement notes and descriptive statistics for variables included in this study, and Appendix 2 describes scale items and factor loadings. Information on fraternity or sorority membership is collected from institutional records at the end of the first college year.[1] In the first stage of our analysis, we empirically model selection into Greek organizations and identify factors predictive of membership, such as family background, high school experiences, academic preparation and social identities. Variables collected in the pre-college survey include sex, race/ethnicity, parent's education, high school type (public, private or religious), and if the student entered college with Advanced Placement (AP) credit. Parents' education refers to the level of attainment of the student's more highly-educated parent (less than bachelor's, bachelor's or graduate/professional degree), if information is available for both parents. Other measures of family or school background include student-reported household income ($US thousands), if the student lived with both parents during the high school years (1 = yes, 0 = no), and a scale of parent–school involvement. A series of questions in the pre-college survey ask students about their expectations for the college years; responses are combined into scales for expectations related to diversity and cultural awareness, skills and career preparation social life and relationships, and personal growth and development. From institutional files we collect Scholastic Aptitude Test (SAT) scores and scholarship athlete status (1 = yes, 0 = no).

[1] At Duke formal recruitment into Greek organizations begins during the spring semester of the first year, although a relatively small number of students join later and not all students remain members across the undergraduate career. In results available upon request, we experimented with a variety of alternative measurements of Greek membership based on student responses to the in-college surveys. Our conclusions are not sensitive to choice of measurement.

Next, we consider how Greek membership is associated with particular campus experiences, activities and other collegiate outcomes. We make use of a breadth of information available collected after selection into Greek organizations has occurred. In each in-college survey, students were asked to describe the racial-ethnic diversity of their campus friends (1 = all or nearly all the same race to 5 = all or nearly all a different race), how important being a good student or social person is to their overall identity (1 = not at all important to 5 = extremely important), and the hours per typical week spent participating in academic activities (including attending classes, studying and doing homework), socializing or partying, participating in leisure activities (including watching TV, reading for pleasure, playing video games and using the internet), participating in extracurricular clubs, attending religious services or praying, and working for pay. Although students were not asked about substance use directly, a series of items gauge how important alcohol and drugs (including marijuana) are to students' enjoyment of campus life and how often alcohol and drugs are present at the social events they attend; these items were combined into a scale.

To further examine how Greek membership influences characteristics of students' social networks, we use information collected in position-generator modules that ask students about their ties to the campus community. Similar to the extensity scores used in studies of social capital and the job search process (Lin et al. 2001), a count of the number of job categories or positions to which the student reports access provides a measure of the breadth of campus networks and range of available social resources. Campus positions include the president/provost/dean, assistant dean/program director/department chair, student support professional, other professional staff, faculty members in the humanities, social sciences, natural sciences and engineering, coach/athletics official, medical center faculty/staff, other staff member, and graduate student. Additionally, students were asked about ties to eight dormitories or residential quads.

Finally, we consider how Greek membership affects academic performance and graduation outcomes. The fourth-year survey, administered in the spring before graduation, asks students about their satisfaction with different aspects of the undergraduate career. These items were combined into scales for satisfaction with coursework and instruction and social life and community. Other questions ask students about plans for next fall (attend school, work full-time or other plans) and if they participated in a study abroad program. Information for grade point average (GPA) and graduation honors is collected from official transcripts.[2]

Analyses

In an attempt to isolate causal effects of Greek membership on student outcomes, we incorporate propensity score matching methods (Rosenbaum and Rubin 1983). Under true laboratory conditions, researchers can directly compare treated and untreated subjects; given random assignment, causality is easily inferred. However, membership in a Greek organization, our treatment in this study, is joined voluntarily (and with consent of the fraternities or sororities), and Greek members are likely to differ from non-Greeks in ways other than their

[2] For family income (8 % missing), missing values were replaced with a regression-predicted score that adjusts for race/ethnicity, parents' education and occupational status, and interest in financial aid. About 10 % of students did not have a complete SAT score in their files; these missing values were replaced with a regression-predicted score based on race/ethnicity, admissions committee evaluations and high school class rank. No other variable contained more than 3 % missing values, which were replaced with mean imputation.

extracurricular participation. Propensity score matching corrects for these pre-treatment differences that could confound effects of membership on collegiate outcomes by comparing Greeks and non-Greeks who are similar across a range of observable characteristics.

It is not possible to know an individual student's likelihood of becoming Greek; rather, we only observe the final resolution of the decision ($G = 1$ if join, $G = 0$ if do not). It is assumed that the decision to join a fraternity or sorority depends on an individual i's unobservable propensity score, I_i, which is determined by pre-treatment covariates. This index can be described as:

$$I_i = \beta_0 + \sum_{j=1}^{k} \beta_j X_{ij} \tag{1}$$

where each X_j entering the index is a variable determined prior to Greek membership. It is assumed that Greek membership occurs if I_i exceeds some unobservable critical level, I_i*. An individual's propensity score can be interpreted as the conditional probability of entering a Greek organization. Correspondingly, our modeling of the decision to join a Greek organization is comprised of estimating a probit model with each X_j included as an independent variable.

In addition to providing a framework for estimating determinants of Greek membership, the propensity score allows us to construct a more relevant counterfactual group. As discussed above, a major issue in determining causal relationships in this context is students who choose to become Greek are likely to differ from those who do not, and in ways that might affect college outcomes. As a solution to this issue, we exploit the richness of the CLL data and use a selection-on-observables approach (Heckman and Robb 1985). In particular, a control group is created for individuals in the treatment group using non-Greek individuals who are most similar in terms of their estimated propensity score. Propensity score matching is a method for weighting each of the entries in the control group, and avoids the issue of having to find an exact match for each entry in the treatment group when a large number of covariates are considered. Using this method, the average difference in outcomes between the two groups can be attributed to an individual student's choice to join a Greek organization (Rosenbaum and Rubin 1983; Heckman et al. 1997).

Specifically, we estimate the effect of Greek membership (or, in the words of the treatment effect literature, the average treatment on the treated, ATT) with the following:

$$ATT = \frac{1}{N_D} \sum_{i \in D} \left\{ Y_i - \sum_{j \in C_j} w(i,j) Y_j \right\} \tag{2}$$

where Y_i, outcome of a student choosing to join a Greek organization; Y_j, outcome of a student choosing not to join a Greek organization; N_D, number of students choosing to join a Greek organization; C_j, set of matched control students; $w(i, j)$, the weighting function.

There are several possible different methods that can be used to generate the weighting functions in Eq. 2 (Imbens 2004). This study uses the two nearest neighbors matching method, which matches cases in the treatment group to the two individuals in the control group with the closest estimated propensity scores.[3] When interpreting results, the mean

[3] All propensity score matching calculations utilized a common support for respondents. As a robustness check, we also used the kernel density methodology, including all students who choose not to become Greek in the control group and weighting them according to similarity with the treatment group observation (i.e., closer observations in terms of propensity scores are given more weight), with the sum of all weights being equal to one. Unless noted, results are not sensitive to the choice of method.

outcome of the treatment group (Greeks) is compared to the weighted mean of the control group. All analyses were conducted with Stata 12.1.

Results

Pre-treatment Comparisons

Table 1 includes pre-college comparisons by eventual Greek status, displaying means (columns I and II) and results from tests for group differences (column III). Upon matriculation and prior to the decision to join a fraternity or sorority, substantial differences between the Greek and non-Greek subsamples are observed. Males are less likely to be Greek members than are females. Additionally, Greeks tend to have more advantaged social origins in comparison to non-Greeks. While 38 % of white students join fraternities or sororities, only 16 % of black and 17 % of Asian students become members. About three-quarters of CLL students have at least one parent who completed a graduate or professional degree. Yet, relative to non-Greeks, Greeks enter college from households with higher incomes, are more likely to have a parent with an advanced degree, and are less likely to have attended public high schools. During adolescence, eventual Greek members have more social capital available in their family environments, including greater parental involvement with school activities and fewer family moves that required a change of schools. Given Greek members' relative advantage in pre-college economic and social resources, it is perhaps surprising that there is no significant difference in the mean SAT scores of Greeks and non-Greeks.

Greek members arrive on campus placing greater emphasis on having an active social life. While both Greeks and non-Greeks generally consider being a good student to be an important part of their identity, fraternity or sorority members place greater importance on being someone who socializes well with others and on expectations for social relationships. These pre-treatment differences in ascribed characteristics and student dispositions are consistent with other studies of Greek membership at elite institutions and underscore the importance of accounting for selection into Greek organizations.

To consider the relative influence of pre-college variables on the likelihood of joining a Greek organization, Table 2 presents estimates from a probit model. For ease of interpretation, results are expressed as marginal effects, or the expected change in probability of joining a Greek organization associated with a 1-unit change in the predictor variable when holding other covariates constant at their mean. For example, black students are 18 % less likely and Asian students are 16 % less likely to be in a fraternity or sorority relative to white students, after adjusting for other variables. An increase in family income of $10,000 is associated with a 1 % increase in the probability of being a Greek member, while a 1 unit increase in the scales for parent–school involvement and social life expectations predicts a 1 and 2 % increase in the probability, respectively. Compared to a student who considers being a social person to be of moderate importance to their overall identity, a student who ranks being a social person as very important is 4 % more likely to join a Greek organization. After adjusting for other variables, Greeks are significantly less likely to have an athletic scholarship, while pre-college importance of having a good student identity is negatively associated with the probability of Greek membership.

The probit estimates in Table 2 were used to derive propensity scores reflecting the latent probability of joining a fraternity or sorority. For example, non-Greek students who are white, have affluent parents and place considerable importance on social goals and identities—all factors that are significant predictors of Greek membership—were assigned

Table 1 Greek versus non-Greek comparisons: pre-treatment variables (n = 1,180)

	I	II	III		IV	
	Greek	Non-Greek	Observed		Matched-control	
	Mean	Mean	Diff.	*p* value	Diff.	*p* value
Male	.45	.53	−.08	.018	.00	.940
Race/ethnicity						
White	.76	.63	.07	.000	.03	.368
Black	.04	.10	−.06	.000	.01	.796
Hispanic	.10	.07	.03	.104	−.04	.158
Asian	.07	.17	−.10	.000	−.01	.796
Other	.04	.03	.01	.408	.01	.495
Family and high school						
Parent's education						
Less than bachelor's	.05	.10	−.05	.008	.03	.104
Bachelor's degree	.14	.18	−.04	.148	−.02	.477
Graduate degree	.81	.73	.08	.006	−.01	.722
Family income ($US thousands)	254.17	181.05	73.12	.000	−10.36	.429
Intact family	.77	.72	.05	.100	.01	.675
Parent–school involvement	11.28	9.87	1.41	.000	.19	.537
Family moves	.87	1.17	−.30	.003	.15	.152
High school type						
Public	.63	.70	−.07	.025	−.03	.436
Private	.24	.19	.05	.088	.00	1.000
Religious	.13	.10	.03	.255	.03	.273
SAT score	1,403.93	1,405.07	−1.14	.875	.40	.963
AP credit	.87	.83	.05	.046	.02	.473
Legacy	.22	.20	.02	.577	−.04	.217
Scholarship athlete	.03	.04	−.01	.181	.01	.315
High school memberships	5.95	5.79	.16	.361	.17	.389
Pre-college identities/expectations						
Good student identity	4.37	4.32	.05	.384	−.05	.427
Social person identity	4.38	4.10	.28	.000	.02	.775
Expectations for college						
Diversity/cultural awareness	6.59	6.74	−.15	.535	.30	.289
Skills/career preparation	14.07	13.69	.38	.012	.14	.340
Social life/relationships	9.42	8.42	1.00	.000	−.05	.762
Personal growth/development	10.21	10.04	.17	.237	−.07	.618

p values refer to tests for group differences, comparing Greeks with non-Greeks (column III) or with the matched-control group as determined by propensity score matching (column IV)

higher propensity scores. Notably, there are no significant differences when comparing the means of fraternity or sorority members to the weighted means of the matched-control group across all observable pre-college variables (Table 1, column IV), providing confidence that we have established an appropriate counterfactual group for the estimation of the effects of Greek membership.

Table 2 Probit estimation of membership in a Greek organization

Variable	Marginal effects	Standard error	*p* value
Male	−.050	.029	.082
Race/ethnicity (ref. white)			
Black	−.175	.038	.000
Hispanic	.015	.042	.728
Asian	−.160	.036	.000
Other	−.002	.065	.978
Parent's education (ref. graduate degree)			
Less than bachelor's	.024	.051	.635
Bachelor's degree	−.016	.038	.669
Family income ($US thousands)	.001	.000	.000
Intact family	−.001	.032	.972
Parent–school involvement	.008	.003	.027
Family moves	−.014	.009	.105
High school type (ref. public)			
Private	.052	.038	.165
Religious	.016	.043	.703
SAT score	−.000	.000	.421
AP credit	.054	.036	.130
Legacy	−.023	.037	.529
Scholarship athlete	−.161	.058	.006
High school memberships	.007	.006	.231
Good student identity	−.035	.019	.070
Social person identity	.039	.019	.036
Expectations for college:			
Diversity/cultural awareness	−.000	.005	.968
Skills/career preparation	.012	.008	.120
Social life/relationships	.023	.007	.001
Personal growth/development	.000	.008	.999
Constant	−1.583	.765	.039
Pseudo R^2			.111
Observations			1,180

Post-treatment Comparisons

Next, we turn our attention to the effects of Greek membership on outcomes collected at the end of the second and fourth college years, after selection into Greek organizations occurs. Table 3 presents mean scores for Greeks and non-Greeks (columns I and II), results from tests for group differences (column III), and results from the propensity score matching analysis (column IV).[4]

[4] Matching weights, mean differences, and resulting *p* values were generated using the psmatch2 command in Stata, with common support. The pstest command in Stata was used to determine post-estimation differences in pre-treatment variables following weighting assignments.

Table 3 Greek versus non-Greek comparisons: post-treatment variables (n = 793 to 1,180)

	I	II	III		IV	
	Greek	Non-Greek	Observed		Matched-groups	
	Mean	Mean	Diff.	*p* value	Diff.	*p* value
Campus networks and social life						
Diversity of campus friends						
Year two	2.16	2.40	−.24	.008	−.03	.798
Year four	2.25	2.49	−.24	.019	−.26	.068
Ties to campus positions						
Year two	3.61	4.16	−.55	.006	−.37	.126
Year four	4.69	5.11	−.42	.072	−.35	.222
Ties to residential halls/dorms						
Year two	7.55	7.12	.43	.001	.44	.006
Year four	5.72	5.29	.43	.072	.42	.172
Prominence of alcohol and drugs						
Year two	6.63	5.26	1.37	.000	.45	.117
Year four	6.78	5.50	1.28	.000	.22	.488
Time allocation (hours/week)						
Academic activities						
Year two	25.01	25.08	−.07	.914	.01	.987
Year four	22.44	22.38	.06	.936	.28	.765
Socializing and partying						
Year two	17.52	13.70	3.82	.000	2.36	.003
Year four	17.60	14.03	3.57	.000	2.60	.003
Leisure activities						
Year two	12.79	14.21	−1.42	.035	−1.08	.200
Year four	16.25	15.92	.33	.697	−.22	.830
Extracurricular clubs and groups						
Year two	3.61	3.59	.02	.944	.15	.676
Year four	4.94	3.99	.95	.007	1.03	.039
Working for pay						
Year two	3.66	3.79	−.13	.730	.45	.351
Year four	4.95	5.47	−.52	.330	.58	.358
Attending religious services						
Year two	.83	1.17	−.34	.012	−.19	.295
Year four	.74	1.04	−.30	.020	.02	.932
Student identities						
Good student identity						
Year two	3.92	4.00	−.08	.283	.02	.786
Year four	3.98	3.97	.01	.940	.01	.918
Social person identity						
Year two	4.17	3.88	.29	.000	.14	.089
Year four	4.13	3.87	.26	.000	−.01	.940

Table 3 continued

	I	II	III		IV	
	Greek	Non-Greek	Observed		Matched-groups	
	Mean	Mean	Diff.	*p* value	Diff.	*p* value
End of college outcomes						
Satisfaction with college						
Coursework and academics	41.46	42.72	−1.26	.104	−2.42	.016
Social life	44.58	39.08	5.50	.000	4.36	.000
Immediate post-graduation plans						
Graduate/professional school	.30	.41	−.11	.012	−.05	.303
Work full-time	.55	.48	.07	.110	.06	.253
Other	.12	.10	.02	.448	−.02	.567
Studied abroad	.60	.38	.22	.000	.14	.009
Academic performance						
Maintained full-time status	.94	.87	.07	.004	.09	.000
Completed degree	.99	.94	.05	.000	.07	.000
Graduation honors	.31	.33	−.02	.658	.04	.235
Grade point average						
Year one	3.30	3.26	.04	.192	.07	.113
Year two	3.35	3.31	.04	.234	.06	.162
Year three	3.47	3.41	.06	.052	.04	.312
Year four	3.54	3.48	.06	.029	.07	.091

p values refer to tests for group differences, comparing Greeks with non-Greeks (column III) or with the matched-control group as determined by propensity score matching (column IV)

Observed differences between Greeks and non-Greeks generally correspond to existing stereotypes and results from previous studies. In particular, Greek members invest relatively more time and energy to campus social life and report a greater prominence of alcohol and drugs. For example, in the second year—when most CLL students have yet to reach legal drinking age—about 33 % of Greeks report that alcohol is very or extremely important to their enjoyment of campus life, and 84 % report that alcohol is often or always present at the social events they attend. In contrast for non-Greeks, about 17 % report similarly high levels of alcohol importance and 57 % report the frequent presence of alcohol at social events. While there are no significant differences for academic time-use or good student identity, Greeks place more emphasis on being a social person and spend more time socializing with friends or partying across the college years. In the fourth year, Greeks spend about one additional hour per week participating in extracurricular activities in comparison to non-Greeks.[5]

In line with numerous studies reporting a negative effect of Greek membership on openness to diversity and support for multicultural programs (Pascarella and Terenzini 2005, p. 617), we observe that Greeks are less likely to have friends on campus from different racial–ethnic groups. Greek members' social networks reach fewer campus

[5] On average, Greeks spend about 20 min less each week attending religious services or praying in comparison to non-Greeks. By a different measure, 40 % of Greeks report spending any time in religious activities compared to 45 % of non-Greeks ($p = .188$).

positions in comparison to non-Greeks, while Greeks report knowing or associating with students in more residential halls or dorms. Although Greeks tend to have relatively homogenous campus networks, fraternity or sorority members are more likely to expand their horizons in other ways. About 60 % of Greeks participated in a study abroad program at some point during the college years, compared to 38 % of non-Greeks.

At the end of their college career, Greeks report higher levels of satisfaction with the quality of social life than do non-Greeks. Comparisons across measures of academic standing and performance reveal slight differences by Greek membership, as well as highlight distinctive characteristics of the elite university student population. At national 4-year institutions, 57 % of entering full-time students complete a degree within 6 years (Horn et al. 2006), and 26 % of college seniors plan to attend graduate school immediately after completing a bachelor's degree (Liu et al. 2009). In the CLL, Greeks are significantly more likely to maintain full-time status throughout the college career and to complete a bachelor's degree, although overall graduation rates are high in comparison to national figures. All but 1 % (n = 2) of fraternity or sorority members in the CLL completed a degree at Duke within 5 years, while Greeks have slightly higher GPAs in years three and four than do non-Greeks.

When comparing the treatment and matched-control groups, most differences related to campus networks and social life are no longer significant (Table 3, column IV), suggesting that observed differences are attributable to pre-college characteristics or selection effects. In particular, when fraternity or sorority members are compared with the matched-control group, differences for extensity of campus networks, time spent in leisure or religious activities, the prominence of alcohol and drugs, and the importance of having a social identity are no longer significant.[6] Although Greeks do have less diverse campus friendship in the fourth year relative to the matched control-group, the difference is now only marginally significant.[7] Further, while there is evidence of a significant Greek effect on social time allocation, the size of the difference declines by 38 and 27 % for the second and fourth years, respectively, after accounting for pre-treatment variables.

Significant differences in mean scores between the treatment and the matched-control groups can be interpreted as evidence of effects of Greek membership on college outcomes. Our results indicate that participation in a Greek organization leads to significantly higher levels of involvement with campus life. In addition to spending more time in social activities, Greeks are more likely to study abroad, spend more time with extracurricular activities in the fourth year, and report more ties to campus residence halls in the second year in comparison to the matched-control group. Relatedly, we find that Greek membership predicts significantly higher levels of satisfaction with social experiences during their undergraduate career. After adjusting for pre-college characteristics, Greeks are significantly less satisfied with their coursework and academic experiences but are more likely to complete their undergraduate degree. There are no significant differences between Greeks and the matched-control group in terms of grades, academic performance and post-graduation plans.

While propensity score matching methods are an improvement over OLS or other traditional methods, the risk of omitted variable bias and model misspecification is still a concern. Accordingly, in analysis available upon request we implemented "doubly robust" methods

[6] When using the kernel density method, there is a small but significant difference for alcohol and drug prominence in the second college year (diff. = .32; $p = .020$).

[7] Matching-methods are susceptible to increased standard errors, due to increased variance in the matched-control group and the exclusion of propensity scores outside the common region. Thus, observed and matched-control differences of similar magnitude can have somewhat different p values.

(Emsley et al. 2008; Ho et al. 2007), which use the propensity score weights generated by the probit estimation for a weighted least squares regression while controlling for all covariates described in Tables 1 and 2. There are no significant differences between the estimates of the impact of Greek membership described in Table 3 and those provided by the "double robust" analysis. Comparing results for the two specifications, the estimated Greek effect is highly consistent in sign, size and level of significance, lending credence to our main estimation results. Further, for each of the outcomes that were statistically significant, we carried out Rosenbaum (2002) bounds tests, which determine the effect size an omitted variable would need for an observed relationship to no longer be statistically significant. Results indicate that in order for any of our reported differences to no longer be significant, an omitted variable would need to have an association that is at least 1.5 times as large in determining the selection into a Greek organization as any variable included in the analysis.

Discussion

In this study, we made use of detailed survey and institutional data combined with propensity score matching methods to estimate the effects of Greek membership on collegiate outcomes. Our results support three broad conclusions: first, in comparison to students who do not join Greek organizations, fraternity or sorority members have more advantaged social origins and arrive on campus placing greater emphasis on maintaining an active social life. Second, although Greeks report a more prominent role of alcohol and drugs to their enjoyment of campus life than do non-Greeks, this difference is attributable to pre-treatment characteristics. Third, after accounting for selection effects, we find that Greek membership leads to higher levels of involvement in and satisfaction with campus social life, and predicts higher graduation rates and degree persistence.

Importantly, our results should not be generalized beyond other highly selective colleges and universities. Not only is fraternity or sorority membership more prevalent at Duke than at national 4-year postsecondary institutions, but also the typical student in the CLL has affluent and highly-educated parents and exhibits at least moderate levels of student engagement and involvement with campus life. For example, about 85 % of the students in this study reported active membership in at least one extracurricular activity. At Duke, nearly two-thirds of fraternity or sorority chapters are housed in on-campus residence halls and most students are required to live on campus through the third college year, providing Greek organizations with a larger role in campus life than would be expected at schools with substantial numbers of commuter students or where most Greeks reside off-campus.

Greek membership is linked to an enduring dominant class advantage in higher education and reflects the legacy of formal and informal policies of exclusion at elite universities (Karabel 2005; Martin 2012; Stuber 2009). Compared to other students on campus, fraternity or sorority members are more likely to be white and enter college from households containing an abundance of economic, social and cultural resources. This advantaged student profile is not surprising, considering the substantial financial costs Greek membership and initiation entail, with dues alone costing as much as $1,000 annually (Duke University 2013).

Keeping in mind the uniqueness of our sample, our results suggest that previous studies—and especially analyses of cross-sectional data—likely overstate the effects of Greek membership. Most observed differences are not significant, and nearly all are smaller in magnitude, when we compare Greeks to a more relevant control group. Contrary to popular stereotypes, we find no evidence that fraternity or sorority membership directly leads to greater substance usage or sociability. Instead, prospective Greek members arrive

on campus placing greater prominence on alcohol and drugs and greater emphasis on being a social person.

Further, we find that Greeks are no less committed to success in the classroom than are other students. There are no significant differences (before or after adjusting for pre-treatment characteristics) in academic time-use or in the importance of being a good student to one's overall identity. Greeks exhibit slightly higher GPAs in comparison to non-Greeks, but there are no significant differences after matching methods are utilized. While these results are in line with the few studies that find small to no differences in levels of academic performance between Greeks and non-Greeks (e.g., Charles et al. 2009; Martin et al. 2011; Pascarella et al. 2001), it is perhaps surprising to not find a Greek advantage given their higher levels of involvement and advantaged family backgrounds. While Greeks may benefit from supportive peer networks—as suggested by the greater time spent socializing with friends and higher graduation rates—Greeks' campus networks tend to be less diverse (more homogenous) and less extensive in comparison to non-members' campus networks. Previous studies link extensive and racially–ethnically diverse campus networks to higher levels of achievement and other positive student development outcomes (e.g., Denson and Chang 2009; Martin 2009).

By disentangling the effects of Greek membership attributable to selection or socialization, our study informs institutional policy and debates about how fraternities and sororities may contribute to campus life. While Greek members do place greater emphasis on the social aspects of the college experience in comparison to non-members, our results suggest that the most undesirable correlates of membership are attributable to students selecting into organizations that match expectations and identities developed prior to matriculation. Thus, efforts to curb underage drinking or promote campus diversity should be campus-wide and not restricted to the Greek system. As noted above, undesirable consequences of Greek membership attributable to selection raise questions about university admission and recruitment policies (Wilder et al. 1997, p. 152). To counterbalance tendencies towards homophilous social networks and group affiliations, possible programs and interventions include randomly assigning roommates, promoting events that require interactions among Greek members and non-members, and placing less emphasis on demonstrations of sociability during the admissions process.

After accounting for selection effects, we find that fraternity or sorority membership leads to more time spent socializing and partying, greater satisfaction with campus social life, and higher graduation rates. By encouraging active involvement in campus life, Greek organizations can serve as a beneficial resource to members, and serve as a model of broader efforts to maximize student retention and degree completion. Further, a visible Greek system likely encourages an active and supportive alumni base beyond the college years. Since individuals tend to select into Greek membership on several common characteristics, universities might consider implementing or expanding community-living type arrangements and other similar alternatives to the Greek system.

As with any study, there remain areas of opportunity to pursue in future work. Although we are able to adjust for a wide range of pre-college characteristics, matching-methods can only control for observable variables as implemented. To the extent that excluded factors associated with selection into Greek organizations are also associated with outcomes, our results could be biased. While data availability remains an obstacle, future studies should apply our design to a broader sample of college students, including students attending less selective institutions, and examine how Greek membership influences personal values and how attitudes change over the college career (DeSantis 2007; Pascarella and Terenzini 2005, pp. 302–323). Also, more consideration should be given to peer-effects in the

determination of selection into fraternities and sororities and in collegiate outcomes. Due to the nature of Greek organizations and the strong emphasis on social interaction among members, significant peer effects on student outcomes may exist, beyond those found at the classroom level (e.g., Arcidiacono et al. 2012; Carrell et al. 2009; Epple and Romano 2011).

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Appendix 1

See Table 4.

Table 4 Measurement notes and descriptive statistics

Variable	Measurement notes	Mean	(SD)	Min.	Max.
Greek	Member of social fraternity/sorority	.34	(.47)	0	1
Male	1 = male, 0 = female	.50	(.50)	0	1
Race/ethnicity	Coded from responses to Census-type questions in the pre-college survey (or institutional records, if missing)				
White		.67	(.47)	0	1
Black		.08	(.27)	0	1
Hispanic		.08	(.27)	0	1
Asian		.14	(.34)	0	1
Other		.03	(.17)	0	1
Parent's education	Coded as the more highly educated parent if available for both parents				
Less than bachelor's degree		.08	(.27)	0	1
Bachelor's degree		.16	(.37)	0	1
Graduate/professional degree		.75	(.43)	0	1
Family income	Student-reported ($US thousands)	205.69	(160.24)	5	550
Intact family	Lived with both parents during high school	.74	(.44)	0	1
Parent–school involvement	Scale for the frequency of activities during student's middle school years (see Appendix 2)	10.35	(4.24)	0	20
Family moves	Count of moves during adolescence that required student to change schools	1.06	(1.64)	0	11
High school type	Collected from the pre-college survey (or institutional records, if missing)				
Public		.68	(.47)	0	1
Private		.21	(.41)	0	1
Religious		.11	(.32)	0	1
Scholastic Aptitude Test (SAT)	Combined score (math. + verbal)	1,404.69	(110.69)	820	1,600
Advanced Placement (AP) credit	Received college credit for any AP exam	.84	(.37)	0	1

Table 4 continued

Variable	Measurement notes	Mean	(SD)	Min.	Max.
Legacy	Have a family member who graduated from Duke	.20	(.40)	0	1
Scholarship athlete	Status at matriculation; from institutional records	.04	(.19)	0	1
High school memberships	Count of extracurricular clubs or groups	5.84	(2.52)	0	16
Pre-college goals and expectations	Scales combining responses for the importance of different expectations for the college years (see Appendix 2)				
Diversity/cultural awareness		6.69	(3.62)	0	16
Skills/career preparation		13.82	(2.19)	4	16
Social life/ relationships		8.76	(2.28)	1	12
Personal growth/ development		10.09	(2.10)	0	12
Good student identity	Importance of being a good student to overall identity or sense of self (1 = not at all important to 5 = extremely important)				
Pre-college		4.35	(.82)	1	5
Year two		3.97	(.97)	1	5
Year four		3.97	(.97)	1	5
Social person identity	Importance of being someone who socializes well with others to overall identity or sense of self (1 = not at all important to 5 = extremely important)				
Pre-college		4.20	(.90)	1	5
Year two		3.98	(.93)	1	5
Year four		3.96	(.90)	1	5
Diversity of campus friends	1 = all or nearly all your race to 5 = all or nearly all a different race				
Year two		2.32	(1.19)	1	5
Year four		2.41	(1.23)	1	5
Ties to campus positions	Count of campus positions to which the student reports knowing or associating with at least one person				
Year two		3.98	(2.60)	0	12
Year four		4.96	(2.75)	0	12
Ties to residential halls/dorms	Count of dormitories and residential hall in which the student knows or associates with at least one other student				
Year two		7.26	(1.78)	0	9
Year four		5.43	(2.83)	0	8
Prominence of alcohol and drugs	Scales combining responses for the importance of alcohol and drugs to campus life and the frequency they are present at campus social events				
Year two		5.71	(3.11)	0	16
Year four		5.94	(3.08)	0	16
Time-allocation					
Academic activities	Hours per week spent attending classes or labs, studying or doing homework, or interacting with faculty outside of class				
Year two		25.06	(7.81)	3.5	44.5
Year four		22.40	(8.65)	0	72

Table 4 continued

Variable	Measurement notes	Mean	(SD)	Min.	Max.
Socializing and partying	Hours per week spent socializing with friends or partying				
Year two		14.96	(8.53)	0	36
Year four		14.25	(8.50)	0	36
Leisure activities	Hours per week spent reading for pleasure, watching TV, playing video games or using the internet				
Year two		13.74	(9.05)	0	67
Year four		16.03	(9.86)	0	57
Extracurricular activities	Hours per week spent participating in extracurricular clubs or groups				
Year two		3.60	(3.76)	0	18
Year four		4.31	(4.24)	0	18
Working for pay	Hours per week spent working for pay (including work-study and off-campus employment)				
Year two		3.75	(4.83)	0	26
Year four		5.29	(6.42)	0	36
Religious activities	Hours per week spent attending religious services or praying				
Year two		1.06	(1.81)	0	13
Year four		.94	(1.68)	0	13
Satisfaction with college	Scales combining ranks for satisfaction with various aspects of the undergraduate career (see Appendix 2)				
Coursework and academics		42.29	(9.19)	8	60
Social life		40.96	(8.04)	0	60
Studied abroad	Academic year or summer program	.46	(.50)	0	1
Maintained full-time status	From official transcripts	.89	(.31)	0	1
Completed degree at Duke	Graduated within 5 years; from official transcripts	.96	(.19)	0	1
Immediate post-graduation plans	Planned major activity in the fall following graduation from Duke				
Graduate/ professional school		.37	(.48)	0	1
Work full-time		.51	(.50)	0	1
Other		.12	(.33)	0	1
Graduation honors	Includes Latin honors (*summa, magna* or *cum laude*), departmental honors and other official recognition	.32	(.47)	0	1
Grade point average	Average grade for all courses taken for credit during the academic year (A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = .0); from official transcripts				
Year one		3.27	(.49)	0	4
Year two		3.32	(.49)	0	4
Year three		3.43	(.46)	0	4
Year four		3.50	(.45)	0	4

Appendix 2

See Table 5.

Table 5 Scale items and factor loadings

Scale items	Factor loading	Coding
Parent–school involvement ($\alpha = .77$)		"During middle school, how often did your parents _____" (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = very often)
Check if you'd done your homework	.65	
Help you with your homework	.65	
Participate in a parent–school organization	.80	
Participate in other school-related activity	.84	
Spend time talking with your friends	.68	
Expectations for college		"Please indicate the extent to which each of these expectations for the college years is important." (0 = not at all important, 1 = somewhat important, 2 = important, 3 = very important, 4 = extremely important)
Diversity/cultural awareness ($\alpha = .76$)		
Meeting people of from different cultures and backgrounds	.69	
Learning to interact with the majority culture	.62	
Learning about my cultural heritage	.87	
Establishing my ethnic/racial identity	.87	
Skills/career preparation ($\alpha = .70$)		
Career preparation	.62	
Academic/intellectual skills	.82	
Academic/intellectual achievement	.85	
Leadership skills	.67	
Social life/relationships ($\alpha = .68$)		
Meaningful social relationships	.76	
Dating relationships	.77	
Having a very active social life	.84	
Personal growth/development ($\alpha = .70$)		
Personal growth/awareness	.70	
Establishing my identity	.79	
Developing a sense of life direction and purpose	.78	
Learning to do things on my own	.65	

Table 5 continued

Scale items	Factor loading	Coding
Prominence of alcohol/drugs (year two, $\alpha = .73$)		0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always
How often is alcohol present at the social events you attend?	.81	
How often are drugs present at the social events you attend?	.80	
How important is alcohol in your enjoyment of campus life?	.77	0 = not at all important, 1 = a little important, 2 = somewhat important, 3 = very important, 4 = extremely important
How important are drugs in your enjoyment of campus life?	.61	
Prominence of alcohol/drugs (year four, $\alpha = .74$)		
How often is alcohol present at the social events you attend?	.79	
How often are drugs present at the social events you attend?	.80	
How important is alcohol in your enjoyment of campus life?	.78	
How important are drugs in your enjoyment of campus life?	.62	
Satisfaction with college		Think about the different aspects of your Duke undergraduate career listed below. On a scale of zero (extremely dissatisfied) to ten (extremely satisfied), how satisfied are you with experiences in each area?
Coursework and academics ($\alpha = .76$)		
Size of classes	.66	
Quality of classes	.83	
Premajor advising	.42	
Your major(s)	.74	
Quality of faculty	.84	
Your major advisor	.56	
Faculty mentor	.58	
Social life ($\alpha = .65$)		
First year on East Campus	.62	
Living on West Campus	.67	
Social life	.76	
Chances to meet people different from you	.53	
Fraternity or sorority experience	.67	
Campus safety	.37	

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