The Greek Experience Revisited:
The Relationships between Fraternity/Sorority Membership and Student Engagement, Learning Outcomes, Grades, and Satisfaction with College

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Executive Summary

Fraternities and sororities are an important part of American higher education with more than 750,000 undergraduate members and at least 9 million living alumni in the United States. Moreover, the espoused values of Greek-letter organizations align closely with the goals of postsecondary education. However, concerns about alcohol use, hazing, sexual assault, and the contributions of fraternities and sororities to student learning and development have led some writers to question the value-added by fraternities and sororities. Surprisingly, research on the educational outcomes of fraternity/sorority membership is limited. Based on his review of the literature, Molasso (2005, p. 8) concluded that research on students in fraternities or sororities "is limited in its nature, scope, and depth." The present research seeks to address the gap in the research literature by examining the relationships among membership in a fraternity or sorority, student engagement and college outcomes (i.e., learning, grades, and satisfaction). The research examined the direct, indirect, and contingent relationships between membership in a Greek-letter organization and college engagement and outcomes. The results of these analyses were cross-validated using a different dataset. This study also used propensity score matching to explore possible causal relationships between fraternity/sorority membership and both student engagement and the outcomes of college.

The data used in this research came from the 2014 and 2017 administrations of the National Survey of Student Engagement (NSSE). Data from the 2017 NSSE administration was used for most of the analyses, and the data from the 2014 administration was used to cross-validate results. Complete data were available for 202,586 students attending 541 institutions that participated in NSSE 2017. The 2014 and 2017 cross-validation samples were drawn from 332 college and universities participating in both survey administrations and included 105,825 students in 2014 and 134,335 students in 2017. The student engagement measures used in the research were 10 engagement indicators from the NSSE questionnaire, along with a measure of the number of high-impact educational practices in which the students participated. College outcomes were represented by students' self-reports of their learning and development, self-reported grades, and a measure of satisfaction with college. The data were analyzed using structural equation modeling to identify the direct and indirect relationships between membership in a fraternity or sorority and both student engagement and college outcomes. In addition, propensity score matching was used to calculate the effects of fraternity/sorority membership on matched samples of members and non-members. Separate analyses were conducted for first-year males, senior males, first-year females, and senior females.

The results of the research indicated that fraternity and sorority members were significantly more engaged than non-members, reported greater gains in learning, and were more satisfied with their college experiences. Fraternity/sorority membership also indirectly improved learning gains, acting through higher levels of student engagement. Fraternity and sorority members reported having lower grades than non-members. These results were not significantly different for the 2014 or 2017 administrations of the NSSE survey. The pattern of results for the matched groups of fraternity/sorority members and nonmembers was virtually identical to the results obtained from structural equation modeling. However, follow-up tests revealed that these results could be the product of variables that were not included in the study. As a consequence, it was not possible to say with certainty that there were causal relationships between fraternity/sorority membership, student engagement, and college outcomes.

The findings of this study indicate that fraternities and sororities are not antithetical to the values of American higher education, as some have suggested. To the contrary, membership in a fraternity or sorority is associated with greater involvement in curricular and cocurricular activities, promotes student learning and development, and promotes satisfaction with the college experiences. Furthermore, the largest positive effects were generally found for first-year students, arguing against deferring recruitment until the second semester or second year. The positive results in this study should not be taken as an indication that fraternities and sororities are not without their challenges. Issues related to alcohol use and abuse, hazing, sexual assault, and academic achievement (i.e., grades) remain. However, these are problems throughout higher education and are not unique to Greek-letter organizations. Effectively addressing these issues will better allow fraternities and sororities to contribute to the academic and social life of American colleges and universities.

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Fraternities and sororities are an important part of American higher education. Drawing on data from the National Panhellenic Conference and the North American Interfraternity Conference, Routon and Walker (2019) reported that there are more than 750,000 undergraduate fraternity/sorority members and at least 9 million living alumni in the United States. Moreover, the espoused values of Greek-letter organizations (e.g., the development of intellectual and practical skills, personal and social development, and community service) align closely with the goals of postsecondary education (Cogswell, Fosnacht, Maynen, Veldkamp, & Pike, 2020). Although the values espoused by fraternities and sororities are aligned with the intended outcomes of higher education, concerns about alcohol use, hazing, and sexual assault have led some higher-education scholars, college and university leaders, and the popular press to question the value-added by fraternities and sororities (Flanagan, 2014; Gregory, 2020; Kuh, Pascarella, & Wechsler, 1996, Maisel, 1990; Perkins, Zimmerman, & Janosik, 2011).

Although concerns about the Greek system have been voiced for more than three decades, research on the educational outcomes of fraternity/sorority membership is limited. Molasco (2005) found that only 2-3% of the articles in the major student affairs research journals dealt with fraternity or sorority membership. Furthermore, most of the fraternity/sorority research has focused on hazing and alcohol use, rather than the effects of Greek membership on academic and personal/social development during college (Barber, Biddix, Hesp, Norman, & Bureau, 2020; Molasso, 2005). Those studies that have examined the academic and personal/social outcomes of fraternity/sorority membership have produced mixed results (Biddix, Matney, Norman, & Martin 2014; Martin Garsh, & Hevel, 2020; Winston & Saunders, 1987). Based on his review of the literature, Molasso (2005, p. 8) concluded that research on students in fraternities or sororities "is limited in its nature, scope, and depth."

The present research seeks to address this gap in the research literature by examining the relationships among membership in a fraternity or sorority, student engagement during college, and college outcomes (i.e., learning, grades, and satisfaction). This research advances knowledge about fraternity/sorority outcomes by examining the direct, indirect, and contingent relationships between membership in a Greek-letter organization and college engagement and outcomes In addition, the current research tests the stability of direct, indirect, and contingent relationships across two different survey administrations in order to cross-validate the results. This study also makes use of quasi-experiment methods (i.e., propensity score matching) to explore causal relationships between fraternity/sorority membership and both student engagement and the outcomes of college.

Background

Many of the theories and models of the effects of college on students posit that college outcomes are products of students' pre-college characteristics, institutional characteristics, and students' experiences during college (Astin, 1970a, 1970b, 1984; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; Pace, 1980, 1984; Pascarella, 1986). Research on Greek-letter organizations treats membership in a fraternity or sorority as an element of the college experience. Within the

college-experience domain, fraternity or sorority membership is presumed to influence curricular and co-curricular engagement (Pike, 2000). In turn, both Greek affiliation and engagement are presumed to influence student outcomes (see Figure 1).

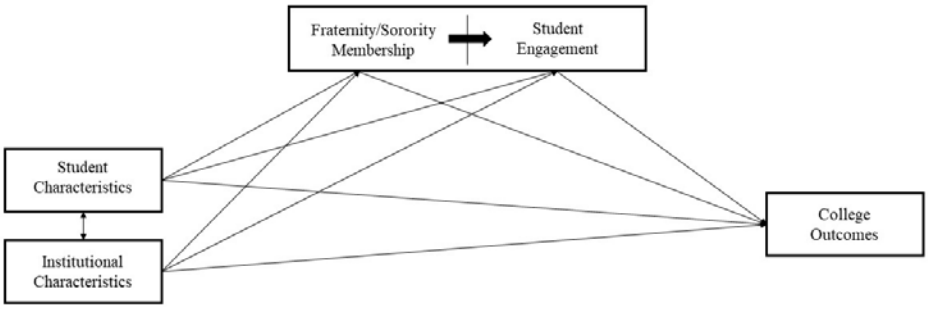


Figure 1: Conceptual Model of Fraternity/Sorority Membership, Student Engagement, and College Outcomes

Greek Affiliation and Student Engagement

The origins of the concept of student engagement can be found in the works of Pace (1980, 1984), Astin (1984), and Kuh (2001). According to Kuh (2003, 2006), student engagement theory is based on two premises: (1) student learning and success in college are positively related to the time and energy students devote to educationally purposeful activities, and (2) institutions can and do influence the extent to which students are engaged in educational activities. Membership in a fraternity or sorority represents one way of influencing engagement in educational activities. Research has consistently shown that student engagement is positively related to learning and success in college (Astin, 1977, 1993; Flynn, 2014; Kuh et al., 2006; Pascarella, Seifert, & Blaich, 2009; Webber, Krylow, & Zhang, 2013; Zilvinskis, Masseria, & Pike, 2017).

Studies exploring the relationships between fraternity/sorority membership and student engagement have produced inconsistent results. Using data from the Cooperative Institutional Research Program (CIRP), Astin (1977, 1993) found that students in Greek-letter organizations generally were more involved than their non-Greek counterparts. However, studies of fraternity/sorority members' *academic* involvement have produced positive results (Pike & Askew, 1990), negative results (Kuh, Pascarella, & Wechsler, 1996), and no relationships whatsoever (Pike, 2000). Mixed results have also been the norm when specific aspects of academic engagement were examined. Both Hayek, Carini, O'Day, and Kuh (2002) and Bureau, Ryan, Ahern, Shoup, and Torres (2011) found that membership in a fraternity or sorority was positively related to collaborative learning, student-faculty interaction, and students' perceptions of a supportive environment for learning. Bureau et al. (2011) also found that fraternity/sorority membership was positively related to academic effort, whereas Hayek et al. (2002) found a negative relationship between class preparation and being a fraternity or sorority member. Likewise, Pike and Askew (1990) found that membership in a fraternity or sorority was negatively related to student-faculty interaction.

The relationships between fraternity/sorority membership and academic engagement also appear to be moderated by students' background characteristics. Routon and Walker (2014) did not find any significant relationships between Greek affiliation and academic engagement for males, but sorority members were significantly more likely than non-Greek women to take on additional coursework, and they were significantly less likely to study with other students. Class standing also appears to moderate the effects of fraternity/sorority membership. Pike (2003), for example, found that among first-year students fraternity/sorority membership was significantly and positively related only to perceptions of a supportive learning environment. For seniors, fraternity/sorority membership was significantly and positively related to collaborative learning, interaction with faculty members, and perceptions of a supportive learning environment. In a more recent study, Asel, Seifert, and Pascarella (2009) reported that members of fraternities or sororities who were first-year students were more likely to interact with faculty, whereas seniors in fraternities or sorority were more likely to interact with peers.

The results of research on the relationships between membership in a fraternity or sorority and co-curricular/social engagement tend to reinforce stereotypes of the Greek system, with some notable exceptions. Dugan (2013) and Walker, Martin, and Hussey (2015) found that fraternity/sorority members were highly engaged in social activities, including partying. Compared to their non-Greek counterparts, fraternity/sorority members were also significantly more likely to be engaged in community service activities (Asel, Seifert, & Pascarella, 2009; Hayek et al., 2002; Porter, 2012). In addition, members of Greel-letter organizations have reported significantly greater co-curricular involvement than their non-Greek peers (Asel, Seifert, & Pascarella, 2009; Bureau et al., 2011; Pike & Askew, 1990; Walker, Martin & Hussey, 2015). There are some exceptions to the positive findings regarding Greek affiliation and co-curricular involvement. Porter (2012) found that fraternity/sorority membership was negatively related to extracurricular involvement. Similarly, Pike and Askew (1990) reported that members of fraternities or sororities had relatively low levels of cultural involvement.

Consistent negative relationships have been found between membership in a Greek-letter organization and diversity experiences (i.e., interacting with diverse others). As Maisel (1990) and Park (2008) noted, Greek-letter organizations tend to be racially/ethnically homogeneous. Moreover, fraternity/sorority members report low levels of interaction with students who are different from themselves (Asel, Seifert, & Pascarella, 2009; Porter, 2012; Williams & Johnson, 2011). An exception to this finding is Black students in Black fraternities or sororities. Harper (2007) and McClure (2006) found that Black fraternities/sororities can assist Black students become more academically and socially integrated in predominantly white colleges and university.

Although the results of research on the relationships between Greek affiliation and co-curricular/social engagement have been generally consistent, there is some evidence to suggest moderating roles for student and institutional characteristics. Asel, Seifert, and Pascarella (2009), Porter (2012), and Walker, Martin, and Hussey (2015) found differences in results depending on student year in school. Porter (2012) also found differences based on student gender and institutional control (i.e., public/private institutions).

Greek Affiliation and Learning Outcomes

In separate literature reviews, Biddix et al. (2014) and Martin Garsh, and Hevel (2020) reported that studies of the relationships between fraternity/sorority membership and objective

tests of student learning have produced inconsistent, although somewhat negative, results. For example, Pike and Askew (1990) found that membership in a fraternity or sorority was negatively related to total scores on the College Outcome measures Program (COMP) Objective Test, but positively related to COMP Functioning in Social Institutions subscores. Conversely, Martin Hevel, Asel, and Pascarella (2011) failed to find significant relationships (positive or negative) between membership in a Greek-letter organization and critical thinking scores on the Collegiate Assessment of Academic Proficiency (CAAP) or moral reasoning scores on the Defining Issues Test (DIT-2).

Inconsistencies in these results may be attributable to moderating effects for student background characteristics. For example, Hevel, Martin Weeden, and Pascarella (2015), as well as Pascarella et al. (1996), found that the relationships between CAAP critical thinking scores differed based on gender and race/ethnicity. Hevel et al. (2015) also found that Greek affiliation had a positive relationship with CAAP critical thinking scores for those students in the top one-third of the distribution of CAAP critical thinking scores on a pre-test. In a follow-up study, Pascarella and his colleagues found that the negative relationships between being a member of a fraternity or sorority and CAAP critical thinking scores were weaker in the second year of college than the first, and weaker still in the third year (Pascarella, Flowers, & Whitt, 2001). This finding led the researchers to conclude: "Thus, the major implication of this would be consider institutional policies that delay pledging of fraternities and sororities until after the first year of college" (Pascarella, Flowers, & Whitt, 2001, p. 298).

Biddix et al. (2014) noted that when students' self-reports have been used to represent learning outcomes, the results for Greek affiliation were more positive. For example, Bureau et al. (2011) found that fraternity/sorority membership was positively related to self-reported gains in general education and gains in practical competence, net the effects of a variety of student characteristics. Similarly, Ahren, Bureau, Ryan, and Torres (2014) reported that students who were members of Greek-letter organizations had significantly greater general education gains than non-Greek students after accounting for differences in the background characteristics of the two groups. Pike (2003) found evidence of a moderating effect for class standing. Specifically, fraternity/sorority membership was not related to first-year academic gains, but it was related to academic gains for seniors. Routon and Walker (2016) also found a moderating effect for gender. Greek affiliation was positively related to knowledge gains for men, but negatively related to knowledge gains for women. Pike (2000) also found evidence of indirect effects for membership in a fraternity or sorority, acting through academic and social engagement.

Research by Asel, Seifert, and Pascarella (2009), Hayek et al. (2002), and by Routon and Walker (2016) found that membership in a Greek-letter organization was positively related to students' reports of the personal/social gains during college. In earlier studies, Wilder and his colleagues found that fraternity and sorority members scored significantly lower than independent students on five measures of personal development as first-year students and as seniors (Wilder, Hoyt, Doren, Hauck, & Zettle, 1978; Wilder, Hoyt, Surbeck, Wilder, & Carney, 1986). More positive is the relationship between Greek affiliation and the development of leadership skills. Cory (2011), Kelley (2008), and Routon and Walker (2016) all found that students in fraternities and sororities reported greater gains in leadership skills than other students. Less positive were the results for intercultural competence. Martin Parker, Pascarella, and Blechschmidt (2015) found no relationship between Greek affiliation and two measures of intercultural competence. Routon and Walker (2016) found that fraternity membership was

positively related to getting along with people of different races and cultures, but negatively related to this outcome for women in sororities. Kuh and Lyons (1990) also found that institutional size moderated personal/social gains, with stronger relationships found for larger institutions.

Greek Affiliation, Grades, and Satisfaction

Research on the relationships between fraternity/sorority membership and students' grade point averages (GPA) has, like research in other areas, produced inconsistent results. Ahren et al. (2014) and DeBard and Sacks (2010) found that Greek affiliation was positively related to GPA, whereas Asel, Seifert, and Pascarella (2009) and Bureau et al. (2011) found membership in fraternities or sororities was negatively related to GPA. Pike and Askew (1990) and Nelson, Halpern, Wasserman, Smit, and Graham (2006) found no relationship between membership in a fraternity or sorority and GPA. This relationship may be moderated by year in school. Several studies have found that deferring recruitment to the second semester or second year of college was associated with higher grade point averages (DeBard, Lake, & Binder, 2006; DeBard & Sacks, 2010; Nelson et al., 2006). Routon and Walker (2014) also found evidence of a moderating role for gender. In their study, Greek membership was negatively related to GPA for males, but not for females.

Fewer studies have examined relationships between membership in a Greek-letter organization and satisfaction with college. Even here, results have been mixed. Pike and Askew (1990) found that fraternity/sorority membership was positively related to satisfaction with college, but Walker, Martin, and Hussey (2015) found that membership in a fraternity or sorority was negatively related to students' satisfaction with their academic experiences.

Conclusions Regarding Greek Affiliation, Student Engagement, and College Outcomes

The primary conclusion to emerge from research on the relationships between membership in a fraternity or sorority and student engagement, student learning, grades, and satisfaction is that the studies have produced inconsistent results (Biddix et al., 2014; Martin Garsh, & Hevel, 2020). It appears that some of the variance in findings reported in the studies reviewed may be attributable to the types of engagement and the types of outcomes being studied. For example, fraternity/sorority membership appears to be most consistently (and positively) related to collaborative learning, but negatively related to interactions with diverse others. Similarly, membership in a fraternity or sorority appears to be positively related to personal development and negatively related to intercultural competence. These findings argue for examining the effects of fraternity/sorority membership on a wide variety of different types of engagement and outcomes.

Another reason for the mixed results may be moderating effects for both gender and year in school. In a substantial number of studies, different results were obtained for males and females and for first-year students and seniors. In order to adequately account for these potential moderators, research on fraternity/sorority membership, student engagement, and college outcomes should separately examine relationships for males and females and for first-year and senior students. Another possible reason for the mixed results concerning the effects of fraternity/sorority membership may be unaccounted for differences in the students, institutions, and time periods across studies. Research should include a variety of measures of student and

institutional characteristics as covariates and should attempt to cross-validate results across different time periods.

Another characteristic of previous research on fraternity/sorority membership, student engagement, and college outcomes is that virtually all of the studies have been observational. With few exceptions, the design of the studies have not been able to account for unobserved (and preexisting) differences between fraternity/sorority members and nonmembers. As Angrist and Pischke (2009) and Murnane and Willett (2011) have pointed out, the presence of unobserved, preexisting differences between groups can bias and confound research findings and make it impossible to draw conclusions about the causal relationships between group membership and educational outcomes. Only the studies by Nelson et al. (2006), Routon and Walker (2016) and Walker, Martin and Hussey (2015). Have used quasi-experimental analyses that could potentially allow for causal claims to be made. Even in these studies, clear evidence of unconfoundedness was not presented, leading to inconclusive evidence regarding the causal effects of fraternity/sorority membership on student engagement and college outcomes.

The present research addressed the limitations of the aforementioned studies by examining the relationships among membership in a fraternity or sorority, student engagement and college outcomes using two nationally representative datasets, each containing a host of variables representing student and institutional characteristics. Following the recommendation of Pike (2000), both direct and indirect relationships were examined. To account for the moderating effects of gender and class standing, separate analyses were conducted for males and females, first-year and senior students. In addition, results were compared across datasets in an effort to cross-validate findings. Finally, the data were reanalyzed using quasi-experimental methods to provide a rigorous test of possible causal effects of fraternity/sorority membership.

Research Methods

Data Sources

The data used in this research came from the 2014 and 2017 administrations of the National Survey of Student Engagement (NSSE). In 2014, nearly 145,000 first-year students and 195,000 seniors from 640 U.S. colleges and universities participated in NSSE (National Survey of Student Engagement, 2014). In 2017, slightly more than 165,000 first-year students and almost 210,000 seniors from 650 institutions participated in NSSE (National Survey of Student Engagement, 2017a). The average institutional response rate in 2014 was 32%, and the average institutional response rate in 2017 was 30% (National Survey of Student Engagement, 2014, 2017a). The primary data source for the present study was NSSE 2017. Data for the cross-validation analyses came from those institutions that participated in both the 2014 and 2017 administrations of NSSE.

Participants

Complete data were available for 202,586 students attending 541 institutions that participated in NSSE 2017. The sample included 87,304 first-year students (28,523 males and 58,782 females) and 115,281 seniors (40,560 males and 74,721 females). The 2014 and 2017 cross-validation samples were drawn from 332 college and universities that participated in NSSE 2014 and NSSE 2017. The 2014 sample included 42,129 first-year students (13,946 males and 28,193 females) and 63,696 seniors (19,554 males and 40,328 females). The cross-validation sample for NSSE 2017 consisted of 59,882 first-year students (19,554 males and 40,328 females)

and 74,453 seniors (27,259 males and 49,194 females). Table 1 presents the descriptive statistics for NSSE 2017. Descriptive statistics for the cross-validation samples are in Appendix A.

Table 1:
Descriptive Statistics for the First-Year and Senior/Male and Female Samples

	Males		Females	
	First-Year	Senior	First-Year	Senior
Fraternity/Sorority Member	0.09	0.11	0.09	0.11
Carnegie Classification-Doctoral	0.42	0.44	0.36	0.37
Carnegie Classification-Master's	0.40	0.42	0.45	0.47
Carnegie Classification-Baccal.	0.16	0.13	0.17	0.14
Carnegie Classification-Other	0.02	0.01	0.02	0.02
Public Institution	0.63	0.68	0.62	0.67
Small Institution	0.20	0.15	0.22	0.18
Medium Institution	0.14	0.12	0.16	0.14
Large Institution	0.19	0.20	0.22	0.23
Very Large Institution	0.47	0.53	0.41	0.44
Asian American	0.07	0.07	0.06	0.06
Black	0.08	0.07	0.09	0.08
Latinx	0.14	0.13	0.14	0.13
Multiracial	0.04	0.03	0.04	0.04
Other Race/Ethnicity	0.01	0.01	0.01	0.01
White	0.66	0.69	0.65	0.68
First-Generation	0.28	0.32	0.33	0.35
Non-Traditional Age	0.04	0.36	0.04	0.30
Veteran	0.03	0.09	0.01	0.02
Full-Time Enrollment	0.96	0.84	0.96	0.84
Online Enrollment	0.03	0.07	0.02	0.09
STEM Major	0.40	0.38	0.21	0.17
Transfer Student	0.08	0.44	0.08	0.42
Live On Campus	0.69	0.18	0.72	0.18
Athlete	0.12	0.07	0.09	0.06
Higher-Order Thinking	37.91	39.34	38.70	40.99
Reflective & Integrative Thinking	34.84	37.27	36.00	39.51
Quantitative Reasoning	29.88	32.66	25.48	27.73
Learning Strategies	36.72	36.69	39.53	39.43
Collaborative Learning	33.35	34.46	33.71	33.91
Discussions with Diverse Others	39.94	40.26	40.09	40.89
Student-Faculty Interaction	21.38	24.91	21.05	25.52
Effective Teaching Practices	39.18	39.34	39.08	40.39
Quality Interactions	42.84	41.79	41.75	42.29
Supportive Environment	36.12	32.21	37.82	33.74
High-Impact Practices	0.69	2.16	0.70	2.45
Learning Gains	34.77	38.04	35.27	39.66
Grades	6.04	6.18	6.28	6.47
Satisfaction	6.43	6.41	6.53	6.61

Among first-year students, more than 80% attended either doctoral/research or Master's universities. Slightly more first-year males attended doctoral/research universities compared to Master's institutions. For first-year females, a noticeably higher proportion attended Master's universities. Almost 63% of first-year males attended public universities, and more than 65% attended large or very large institutions. Percentages for females were quite similar. Among seniors, approximately 85% of the males and 84% of the females attended doctoral/research or Master's universities. Males tended to be evenly divided between doctoral and Master's universities, whereas a higher proportion of females attended Master's institutions. Approximately two-thirds of the seniors attended public universities. Approximately 72% of the senior males attended large or very large institutions, compared to 67% of the senior females.

Approximately 9% of the first-year males and females were members of fraternities or sororities. Among seniors, these percentages were 11%. The preponderance of students in the sample were white (66% first-year males, 65% first-year females, 69% senor males, and 68% seniors females). Latinx students comprised the next largest race/ethnic group, followed by Blacks. Very few first-year students were 24 years of age or older. However, almost 36% of the senior males and 30% of the females were 24 or older. Approximately 28% of first-year males were first-generation, compared to 33% of first-year females. The corresponding percentages for senior males and females were 32% and 35%, respectively. More than 95% of first-year males and females were full-time students, compared to 84% for seniors. Approximately 70% of the first-year students lived on campus, compared to 18% of the seniors. Relatively few students reported taking all of their courses online during the semester in which they were surveyed.

Means on the NSSE engagement indicators were similar or slightly higher for first-year females compared to males. The exception was for quantitative reasoning, where first-year males had a noticeably higher mean score. A similar pattern was found for seniors, although seniors tended to have slightly higher mean scores than first-year students on the engagement indicators. An exception to higher scores for seniors was the Supportive Campus Environment indicator. Means for first-year males and females were 36.12 and 37.82, respectively. Comparable mean scores for senior males and females were 32.21 and 33.74, respectively. First-year females reported having higher grades and being somewhat more satisfied than first-year males. A similar, but somewhat more pronounced, pattern was found for senior males and females.

Measures

The measures used in this study came from three sources. Institutional characteristics (Carnegie classification, institutional control, and enrollment size) were obtained by NSSE from the Integrated Postsecondary Education Data System (IPEDS) (National Center for Education Statistics, n.d.). Three measures of student characteristics (gender, race/ethnicity, and class standing) were obtained from institutional records submitted by participating colleges and universities as part of the NSSE survey process. All other measures were obtained from students' self-reports using NSSE's questionnaire the *College Student Report.*

There is a substantial body of research dealing with the adequacy and appropriateness of using self-reports in research on college students. Early studies found that students' self-reports were appropriate measures of engagement and learning (Baird, 1976; Berdie, 1971; Dumont & Troelstrup, 1980; Pace, 1984, 1985; Pholman & Beggs, 1974). More recently, some researchers have questioned the appropriateness of self-report measures (Bowman, 2011; Bowman & Hill, 2011; Bowman & Seifert, 2018; Gordon, Ludlum, & Hoey, 2008; LaNasa, Cabrera, &

Transgrud, 2009; Bisbett & Wilson, 1977; Pascarella, 2011; Porter, 2011). Criticisms of self-reports have included the inability of students to precisely quantify their levels of engagement, halo error, and social desirability.

In responding to criticisms of self-reports, it is helpful to distinguish between students self-reports of their engagement and self-reports of learning. Regarding self-reports of engagement, research has found that students will accurately report on their educational activities when five conditions are met:

1. The information is known to respondents;
2. The questions are phrased clearly and unambiguously;
3. The questions refer to recent activities;
4. The respondents think the questions merit a serious and thoughtful response; and
5. Answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways (Kuh et al., 2001, p. 4).

Studies show that the NSSE engagement indicators meet these five criteria and yield appropriate measures of students' engagement during college (Carini, Kuh, & Cline, 2006; Kuh, 2001; Kuh et al., 2001; Ouimet, Bunnage, Carini, Kuh, & Kennedy, 2004; Pascarella, Seifert, & Blaich, 2009). Recent research by Rocconi, Dumford, and Butler (2020) indicates that the use of vague quantifiers in the *College Student Report* improved the accuracy and appropriateness of self-report data.

Many of the studies examining the adequacy and appropriateness of students' self-reports of their learning have focused on the convergence of self-reports with objective measures of learning. Studies by Birdie (1971), Dumont and Troelstrup (1980), and Pholman and Beggs (1974) all found moderate positive correlations between self-reports and test scores. Pike (1995, 1996) used multitrait-multimethod analysis to examine the relationships between self-reported learning and standardized test scores. He found modest, consistent, positive correlations between self-reports and test-scores. In a second set of studies, Baird (1976) and Valiga (1986) examined the relationships between self-reports and actual grades. Both studies found that self-reported and actual grades were strongly correlated. Baird's (1976) study also found that students accurately reported their grades, even when there were strong incentives to be inaccurate.

Astin (1977), Baird (1976), Pace (1984, 1985) and Pike and his colleagues (Pike, 2011; Pike, Smart, & Ethington, 2011, 2012) examined the relationships between major field and self-reports of learning. Astin (1977), Baird (1976), and Pace (1984, 1985) found that academic major and self-reports of learning were significantly related in logically consistent ways. Pike and his colleagues (Pike, 2011; Pike, Smart, & Ethington, 2011, 2012) examined self-reported learning and college major using Holland's (1997) theory applied to academic environments. The relationships they observed were stronger than in previous research, possibly due to the predictive utility of Holland's theory. Taken as a whole, research on students' self-reports of engagement and learning outcomes indicates that self-reports can provide adequate and appropriate data regarding college students' college experiences.

The participants' responses to the NSSE questionnaire yielded four classes of measures: the independent variable (i.e., fraternity/sorority membership), engagement indicators, college outcomes, and covariates (student and institutional characteristics). Membership in a fraternity or

sorority was measured by the question "Are you a member of a social fraternity or sorority?" Students' responses were scored so that fraternity/sorority membership was a dichotomous variable indicating that the student was (1) or was not (0) a fraternity/sorority member.

Student engagement was represented by the 10 NSSE engagement indicators, and a measure of student participation in high-impact practices. Four engagement indicators (Higher-Order Learning, Reflective & Integrative Learning, Learning Strategies, and Quantitative Reasoning) represented the level of academic challenge in students' college experiences. Collaborative Learning and Discussions with Diverse Others were indicators of learning with peers, and two indicators (Student-Faculty Interaction and Effective Teaching Practices) represented students' experiences with faculty members. The campus environment was represented by the engagement indicators Quality of Interactions and a Supportive Environment (National Survey of Student Engagement (2018). The engagement indicators were scored on a scale from 0 to 60, with 0 representing low engagement and 60 representing extremely high levels of engagement. Alpha reliabilities for the engagement indicators ranged from 0.76 to 0.88 for first-year students and from 0.77 to 0.89 for seniors (National Survey of Student Engagement, 2017b). The high-impact practices measure was a count variable indicating in how many of three activities for first-year students, and in how many of six activities for seniors, students participated (National Survey of Student Engagement, 2018). Appendix B presents the questions used to create the engagement measures and internal consistency (i.e., alpha reliability) coefficients for the scales.

College outcomes were represented by three measures. The first measure, gains in learning, was the sum of 10 items asking students how much their college experiences contributed to their knowledge and personal development. The questions used to create the scale are listed in Appendix B. Alpha reliability for both first-year students and seniors were 0.91. The second college outcome, grades in college, was measured by the question, "What have most of your grades been up to now at this institution?" Response options ranged from "C– or lower" (1) to "A" (8). The final outcome measure, satisfaction with college was measured by the sum of responses to two questions: "How would you evaluate your entire educational experience at this institution?" and "If you could start over again, would you go to the same institution you are now attending?" Alpha reliabilities for the satisfaction measure were 0.76 for first-year students and 0.81 for seniors. In order to facilitate the interpretation of effect sizes, the engagement and outcome measures were standardized to have means of 50 and standard deviations of 10.

Covariates were included in the analyses to account for some of the preexisting differences between fraternity/sorority members and independent students that might bias the results. These variables represented institutional characteristics, students' pre-college characteristics, and students' enrollment characteristics. An institution's Carnegie classification was represented by two dummy-coded variables: Master's institutions and baccalaureate institutions. Doctoral/research universities served as the reference group. Institutional control was a dichotomous variable indicating that an institution was a public college/university. Enrollment size was represented by three dummy-coded variables: small institutions (fewer than 2,500 students), medium institutions (2,500-4,999 students), and large institutions (5,000-9,999 students). Very large institutions (10,000 or more students) served as the reference group.

Among the measures of pre-college characteristics, race/ethnicity was represented by five dummy variables indicating whether a student as Asian, Black Latinx, multiracial, or another race/ethnicity (e.g., Native American or Pacific Islander). White students served as the reference

group. International students were not included in the study. Other pre-college characteristics included whether students were first-generation, nontraditional age (i.e., 24 or older), and if the student was a veteran. Enrollment characteristics included full-time enrollment, taking all courses online during the survey semester, majoring in a STEM discipline, whether the student had ever transferred from another institution, and whether the student lived on campus at the time of the survey.

Data Analysis

The data analysis was conducted in three phases using the Stata15 computer program (StataCorp, 2017). For the first phase of the data analysis, structural equation modeling was used to identify the direct relationships between membership in a fraternity or sorority and both the student engagement and college outcome measures. The models also were used to identify the indirect relationships between fraternity/sorority membership and college outcomes, mediated by student engagement. Separate analyses were conducted for males and females and for first-year and senior students. Institutional characteristics, pre-college characteristics and enrollment characteristics were included in the models as covariates. Because students were nested within institutions, clustered standard errors were used to account for possible dependencies in the data Sarzosa, 2012).

In the second phase of the data analysis, structural equation models were independently specified and tested for both the 2017 and 2014 cross-validation samples. By including the covariates in these models, the coefficients for fraternity/sorority membership represent unique relationships that were not influenced by the covariates. Here again, separate analyses were conducted for males and females and for first-year and senior students, and clustered standard errors were utilized for the analyses. The final step in this phase of the data analysis was to compare the unstandardized coefficients for the 2014 and 2017 datasets to identify differences across years.

The third phase of the data analysis involved comparing the engagement and outcome measures of fraternity and sorority members in the NSSE 2017 to a matched sample of independent students. Once again, separate analyses were conducted for males and females, as well as first year students and seniors. The first step in the data analyses involved calculating the probability (i.e., propensity) of each student being a member of a fraternity or sorority. These propensity scores were calculated by specifying and testing a logistic regression model in which membership in a fraternity or sorority was the dependent variable and the covariates representing institutional, pre-college and enrollment characteristics were the independent variables. Using the coefficients produced by these models, propensity scores were calculated for each student. An important assumption of this approach is that there is sufficient overlap in the characteristics of Greek and independent students so that there is a group of independent students who have propensity scores that are highly similar to fraternity/sorority members (Holmes, 2014; Imbens & Wooldridge, 2009). The overlap assumption was tested by plotting the propensity scores of both groups and visually inspecting the plots (StataCorp, 2017).

Matched samples of fraternity/sorority members and independent students were obtained using one-to-one propensity score matching. That is, for each fraternity or sorority member one or more independent students were identified who had highly similar propensity scores. Following the recommendation of Guo and Fraser (2015) the difference between propensity scores required to match fraternity/sorority members and non-members (i.e., the caliper) was set

at one-quarter of the standard deviation of the propensity scores. For first-year males, three fraternity members did not have any independent students with propensity scores within the caliper and these students were dropped from the data analysis. An important assumption of propensity score matching is that the matched groups will not differ substantively on any of the covariates used to calculate the propensity scores. This covariate balance assumption was tested using standardized differences to avoid the confounding effects of sample size on t-tests (Rosenbaum & Rubin, 1985). According to Rosenbaum and Rubin (1985), standardized differences of less than an absolute value of 0.10 indicate excellent covariate balance.

The final step in this phase of the data analysis was to calculate average treatment effects on the treated (ATET) in order to determine if membership in a fraternity or sorority was associated with significant differences in engagement or college outcomes (Angrist & Pischke, 2009). A critical assumption of calculating treatment effects using propensity score matching is termed conditional independence. The conditional independence assumption holds that there are no unmeasured variables that are related to both membership in a fraternity or sorority and the outcome measures of interest (Imbens & Wooldridge, 2009; Murnane & Willett, 2011). Although it was not possible to directly test this assumption, it was possible to assess the sensitivity of the ATET estimates to the effects of unobserved variables (Rosenbaum, 2002). For the current study, Rosenbaum bounds (rbounds) were used to assess the sensitivity of the ATET to unobserved variables (Rosenbaum, 2002). This sensitivity analysis posits the existence of an unobserved variable and examines the impact of increasing the strength of the relationship between the unobserved variable and fraternity/sorority membership on the statistical significance of the ATET, such that increasing the strength of the relationship between the unobserved variable and selection reduces the likelihood of finding statistically significant treatment effects. The rbounds test is a conservative estimate of the robustness of treatment effects because it assumes a perfect relationship between the unobserved measure and the outcome (DiPrete & Gangl, 2004). A less than perfect relationship between the unobserved variable and the outcome would mean that the impact of the unobserved variables on the statistical significance of the treatment effect would be less pronounced. In educational research and the social sciences, strong evidence of conditional independence is difficult to obtain. Researchers note that most bounded effects range from 1.0 to 2.0 in the social sciences (Caliendo & Kopeing, 2005; DiPrete & Gangl, 2004). For the purposes of this study, rbounds estimates of 1.5 to 1.9 represented moderate to strong evidence of conditional independence, whereas rbounds estimates of 2.0 or higher represented very strong evidence of conditional independence.

Results

Characteristics of Fraternity and Sorority Members

Table 2 presents the means for fraternity members and non-members (independent students). Separate results are presented for first-year and senior students. An examination of the data in Table 2 reveals that first-year Fraternity members are slightly more likely than independent students to attend doctoral/research universities and slightly less likely to attend Master's institutions. Compared to their counterparts who are not fraternity members, first-year fraternity members were much more likely to be white and less likely to be Asian, Black or Latinx. Fraternity members are less likely to be first-generation students, less likely to major in a STEM field, and more likely to live on campus.

Senior fraternity members also are more likely to attend doctoral/research universities and less likely to attend Master's institutions. Racial and ethnic differences between fraternity members and non-members are less pronounced, but still present for seniors. Seniors who are fraternity members are more likely to be enrolled full-time, less likely to take all of their courses online, and are less likely to major in a STEM field. Senior fraternity members, compared to their counterparts who do not belong to a fraternity, are much more likely to live on campus and much less likely to be transfer students.

Table 2:
Descriptive Statistics for the First-Year and Senior Male Students

	First-Year		Senior	
	F/S Member	Independent	F/S Member	Independent
Carnegie Classification-Doctoral	0.45	0.41	0.45	0.43
Carnegie Classification-Master's	0.37	0.41	0.37	0.43
Carnegie Classification-Baccal.	0.17	0.16	0.17	0.12
Carnegie Classification-Other	0.01	0.02	0.01	0.01
Public Institution	0.65	0.63	0.64	0.69
Small Institution	0.22	0.20	0.20	0.15
Medium Institution	0.11	0.14	0.13	0.12
Large Institution	0.20	0.19	0.20	0.20
Very Large Institution	0.48	0.47	0.47	0.53
Asian American	0.05	0.07	0.05	0.07
Black	0.04	0.08	0.08	0.06
Latinx	0.11	0.14	0.11	0.13
Multiracial	0.04	0.04	0.04	0.03
Other Race/Ethnicity	0.01	0.01	0.01	0.01
White	0.76	0.65	0.72	0.69
First-Generation	0.22	0.29	0.26	0.32
Non-Traditional Age	0.02	0.04	0.20	0.38
Veteran	0.03	0.03	0.07	0.09
Full-Time Enrollment	0.98	0.96	0.90	0.84
Online Enrollment	0.03	0.03	0.04	0.07
STEM Major	0.36	0.41	0.34	0.38
Transfer Student	0.08	0.08	0.26	0.47
Live On Campus	0.82	0.68	0.32	0.16
Athlete	0.12	0.12	0.08	0.07

Table 3 presents the descriptive statistics for both first-year and senior sorority members and nonmembers. Like fraternity members, first-year sorority members are more likely to attend doctoral/research universities and less likely to attend master's institutions. First-year sorority members are less likely than non-members to attend small or medium institutions and more likely to attend large or very large institutions. First-year sorority members tend to be overwhelmingly white, with relatively few Asian, Black, or Latinx members. First-year sorority members, compared to nonmembers, are much less likely to be first-generation students or enroll

in a STEM major. Conversely, first-year sorority members are more likely to be enrolled fulltime and substantially more likely to live on campus.

Sorority members who are seniors are also more likely to attend doctoral research universities and less likely to attend Master's institutions. Seniors who are members of a sorority are somewhat less likely to attend public institutions than seniors who are not members of a sorority. Race and ethnic differences between sorority members and non-members are not a pronounced for seniors, but are still noteworthy. Senior sorority members are less likely than non-members to be first-generation students and non-traditional age students. They are also less likely to be transfer students, but more likely to be enrolled full-time and to live on campus.

Table 3:
Descriptive Statistics for the First-Year and Senior Female Students

	First-Year		Senior	
	F/S Member	Independent	F/S Member	Independent
Carnegie Classification-Doctoral	0.42	0.35	0.41	0.36
Carnegie Classification-Master's	0.41	0.46	0.41	0.48
Carnegie Classification-Baccal.	0.16	0.17	0.18	0.14
Carnegie Classification-Other	0.01	0.02	0.01	0.02
Public Institution	0.63	0.62	0.63	0.67
Small Institution	0.20	0.22	0.20	0.18
Medium Institution	0.12	0.16	0.14	0.14
Large Institution	0.24	0.21	0.23	0.23
Very Large Institution	0.44	0.40	0.43	0.44
Asian American	0.03	0.06	0.04	0.06
Black	0.03	0.10	0.07	0.08
Latinx	0.09	0.15	0.10	0.13
Multiracial	0.04	0.04	0.03	0.04
Other Race/Ethnicity	0.01	0.01	0.01	0.01
White	0.81	0.64	0.75	0.68
First-Generation	0.23	0.34	0.26	0.36
Non-Traditional Age	0.01	0.04	0.11	0.32
Veteran	0.01	0.01	0.01	0.02
Full-Time Enrollment	0.99	0.96	0.91	0.83
Online Enrollment	0.01	0.02	0.04	0.10
STEM Major	0.18	0.21	0.17	0.17
Transfer Student	0.06	0.08	0.22	0.45
Live On Campus	0.87	0.71	0.28	0.17
Athlete	0.07	0.09	0.06	0.06

The logistic results used to calculate propensity scores provided an indication of the unique relationships between being a member of a fraternity or sorority and institutional characteristics, pre-college characteristics, and enrollment characteristics, net the effects of the other independent variables in the models. All four analyses indicated that Greek affiliation was significantly related to the covariates, and the covariates included in the models accounted for between 9% and 16% of the variance in the underlying probability that a student would be a

member of a fraternity or sorority. Odds ratios (i.e., the change in the odds of being a fraternity/sorority member given a one-unit change in the covariate are presented in Table 4.

Table 4:
Logistic Regression Results for Male and Female First-Year and Senior Students

	Male		Female	
	First-Year	Senior	First-Year	Senior
Carnegie Classification-Master's	0.81	0.77[a]	0.81	0.76[a]
Carnegie Classification-Baccal.	0.89	0.91	0.95	1.10
Carnegie Classification-Other	0.29[c]	0.49[b]	0.20[c]	0.35[b]
Public Institution	1.31	1.14	1.00	1.05
Small Institution	1.30	1.22	0.79	0.88
Medium Institution	0.93	1.15	0.73	1.04
Large Institution	1.09	1.18	1.04	1.14
Asian American	0.60[d]	0.74[b]	0.46[d]	0.57[d]
Black	0.39[d]	1.25[b]	0.21[d]	0.96
Latinx	0.78[b]	0.97	0.61[d]	0.89
Multiracial	0.81	1.12	0.70[b]	0.89
Other Race/Ethnicity	0.94	0.84	0.77	0.66[b]
First-Generation	0.87[a]	0.90[a]	0.78[d]	0.84[d]
Non-Traditional Age	0.33[d]	0.60[d]	0.40[d]	0.46[d]
Veteran	1.84[d]	1.37[c]	1.62	1.23
Full-Time Enrollment	1.22	1.03	1.69[c]	1.05
Online Enrollment	3.38[d]	0.96	1.56[b]	0.91
STEM Major	0.75[c]	0.74[d]	0.74[d]	0.79[d]
Transfer Student	1.18	0.55[d]	1.06	0.51[d]
Live On Campus	2.12[d]	1.79[d]	2.28[d]	1.41[d]
Athlete	0.83[a]	0.81[b]	0.69[d]	0.71[d]

[a]$p<0.05$; [b]$p<0.01$; [c]$p<0.001$; [d]$p<0.0001$

In interpreting odds ratios, it is important to understand that odds ratios less than 1.00 represent a decreased likelihood of being a fraternity/sorority member, whereas odds ratios greater than 1.00 represent an increase in the odds of being a fraternity/sorority member. An examination of the odds ratios in Table 4 reveals that few of the institutional characteristics are significantly related to membership in a fraternity or sorority. Attending a Master's institution lowered the odds of being a member of a fraternity or sorority for senior males and females, but not for first-year students. Attending an institution with a Carnegie Classification of "Other" (i.e., a special mission institution) decrease the odds of fraternity/sorority membership for all groups of students. This result should be viewed with some skepticism, however, owing to the small numbers of students attending these institutions.

Being Asian, Black, or Latinx, as opposed to white (the reference group) significantly reduced the odds that a first-year student would be a member of a fraternity or sorority. These relationships were not as clear cut for seniors. Asian American males were less likely to be fraternity members, but Black males were more likely to have joined a fraternity. For women, being an Asian American lowered the odds of being a member of a sorority, but being Black or

Latinx did not. Being a first-generation student or a non-traditional age student both lowered the odds of a student being a member of a fraternity or sorority. These relationships held across all four groups. Net the effects of other covariates, being a veteran increased the odds of being a fraternity member, and online enrollment increased the odds of being a member of a fraternity or sorority for first-year students, but not seniors. Again, the relatively small number of veterans and students enrolled exclusively in online courses during the semester they completed the NSSE survey suggests that these results whould be interpreted with caution. Living on campus significantly increased the odds of being a fraternity/sorority member, whereas majoring in a STEM discipline lowered the odds of fraternity/sorority membership. Being a transfer student lowered the odds of being a fraternity or sorority member for seniors, but not first-year students.

Direct and Indirect Relationships between Fraternity/Sorority Membership, Student Engagement and College Outcomes

Structural equation modeling of the relationships between fraternity/sorority membership and both the student engagement and college outcome measures revealed that membership in a fraternity or sorority was directly related to both student engagement and college outcomes. Moreover, fraternity/sorority membership was indirectly related to college outcomes. Results for first-year and senior fraternity and sorority membership are presented in Table 5.

Table 5:
Relationships between Membership in a Fraternity/Sorority, Engagement, and Outcomes

	Fraternities		Sororities	
Engagement/Outcome Measure	First-Year	Senior	First-Year	Senior
Higher-Order Thinking	0.41[a]	0.57[c]	0.63[c]	0.38[b]
Reflective & Integrative Thinking	0.56[a]	0.86[d]	0.51[b]	0.34[b]
Quantitative Reasoning	1.05[d]	1.36[d]	0.92[d]	0.84[d]
Learning Strategies	0.72[c]	0.68[c]	0.62[c]	0.30[a]
Collaborative Learning	3.14[d]	2.48[d]	2.60[d]	2.16[d]
Discussions with Diverse Others	1.67[d]	1.49[d]	0.99[d]	0.94[d]
Student-Faculty Interaction	2.91[d]	1.81[d]	1.99[d]	1.60[d]
Effective Teaching Practices	-0.77[c]	-0.00	-0.24	0.01
Quality of Interactions	-0.77[c]	-0.50[a]	0.23	0.17
Supportive Environment	0.82[d]	0.40[a]	1.01[d]	0.81[d]
High-Impact Practices	1.86[d]	2.38[d]	0.66[c]	2.04[d]
Perceived Learning–Direct	0.66[c]	0.18	0.55[d]	0.16
Indirect	0.80[d]	0.63[d]	0.86[d]	0.69[d]
Grades–Direct	-1.32[d]	-1.39[d]	-0.39[a]	-0.91[d]
Indirect	0.01	0.23[d]	-0.04	0.23[d]
Satisfaction–Direct	0.69[c]	0.17	0.76[d]	0.45[b]
Indirect	-0.17	-0.06	0.30[b]	0.25[b]

[a]$p<0.05$; [b]$p<0.01$; [c]$p<0.001$; [d]$p<0.0001$

An examination of the coefficients in Table 5 reveals that being a member of a fraternity or sorority was significantly and positively related to all of the NSSE engagement indicators, except Effective Teaching Practices and Quality of Interactions. For both first-year and senior fraternity and sorority members, the strongest positive relationships were found for Collaborative Learning

and Student-Faculty Interaction. Additionally, the relationships were stronger for first-year students than seniors. For Collaborative Learning, the effect sizes ranged from slightly more than two-tenths of a standard deviation to almost one-third of a standard deviations, and for Student-Faculty Interaction the effect sizes ranged from 0.16 of a standard deviation to almost three-tenths of a standard deviation. Relatively large effects were also found for Quantitative Reasoning and Discussions with Diverse Others. In both instances, the relationships were somewhat stronger for males than females. Effective Teaching Practices scores were negatively related to only first-year students' membership in a fraternity, and the negative relationships between Greek affiliation and Quality of Interactions was significant only for membership in a fraternity, not a sorority. It is also worth noting that the effect size for all of these negative relationships were well below one-tenth of a standard deviation.

Fraternity/sorority membership was also positively and significantly related to students' participation in high-impact practices, with larger effects generally found for fraternity members. The effect size for first-year students in a fraternity was almost two-tenths of a standard deviation, and the effect size for seniors in a fraternity was almost a quarter of a standard deviation. For first-year students in a sorority, the effect size was less than one-tenth of a standard deviation, but the corresponding effect size for seniors in sororities was slightly more than two-tenths of a standard deviation.

Membership in a fraternity or sorority had modest direct effects on students' reports of their learning gains for first-year students, but not for seniors. However, the indirect effects of fraternity/sorority membership, mediated by the strong positive relationships between membership in a fraternity or sorority and student engagement, were positive and significant. As with the direct relationships, the indirect relationships were somewhat stronger for first-year students compared to seniors. The relationships between fraternity and sorority membership and grades was negative and significant for both first-year students and seniors. Effect sizes were larger for males than females. These negative relationships were mediated somewhat by significant positive indirect relationships for senior fraternity and sorority members. Fraternity membership had a modest positive direct relationship to satisfaction with college for first-year students, whereas sorority membership had modest positive relationships with satisfaction for both first-year and senior students. Membership in a sorority also had significant, but modest, positive indirect relationships with satisfaction for first-year and senior students.

Cross-Validation of Results

An examination of the cross-validation results presented in the first sub-table of Table 6 reveals that although the magnitudes of the coefficients and levels of statistical significance for the 2014 and 2017 samples differ somewhat, the pattern of results is very similar across years and class levels. In general, fraternity membership was positively related to all of the student engagement measures, except Effective Teaching Practices and Quality of Interactions. For those two engagement indicators the relationships were negative. The exception to this pattern was the positive relationship between fraternity membership and Quality of Interactions for the NSSE 2014 seniors. T-values are included in the table in order to identify statistically significant results. Because of the relatively large number of t-tests conducted and the large sample sizes, t-values less than 2.58 ($p<0.01$) should be viewed with skepticism. Only one t-test (Quality of Interactions for seniors) produced a statistically significant difference ($p < 0.05$), and the t-value was well below the 2.58 cutoff.

Table 6:
Relationships between Students' Membership in a Fraternity/Sorority, Engagement, and Outcomes for NSSE 2014 and NSSE 2017

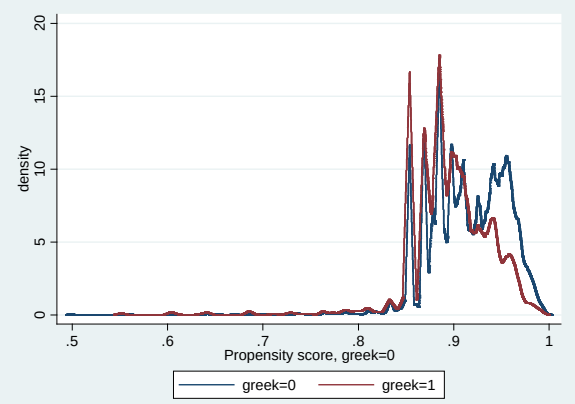
	Results for Fraternity Membership					
	First-Year			Seniors		
Engagement/Outcome Measure	2014	2017	t-value	2014	2017	t-value
Higher-Order Thinking	0.84[a]	0.48[a]	0.88	0.65[b]	0.51[a]	0.47
Reflective & Integrative Thinking	1.25[c]	0.47	1.76	0.81[c]	0.92[d]	-0.34
Quantitative Reasoning	1.40[d]	1.06[d]	0.82	1.12[d]	1.24[d]	-0.42
Learning Strategies	1.00[b]	0.90[d]	0.25	0.77[b]	0.61[c]	0.51
Collaborative Learning	2.53[d]	2.92[d]	-0.87	2.40[d]	2.29[d]	0.36
Diverse Discussions	1.86[d]	1.68[d]	0.37	1.96[d]	1.45[d]	1.34
Student-Faculty Interaction	2.87[d]	2.93[d]	-0.14	1.97[d]	1.91[d]	0.16
Effective Teaching Practices	-0.11	-0.80[b]	1.51	-0.01	-0.05	0.14
Quality of Interactions	-0.14	-0.56	0.96	0.29	-0.46	2.04[a]
Supportive Environment	0.97[b]	0.88[c]	0.21	0.44	0.43[a]	0.03
Perceived Learning–Direct	0.73[b]	0.74[c]	-0.03	0.32	0.21	0.46
Indirect	1.05[d]	0.80[d]	0.76	0.67[c]	0.52[c]	0.64
Grades–Direct	-1.05[b]	-1.35[d]	0.60	-1.21[d]	-1.29[d]	0.23
Indirect	0.12	0.03	0.90	0.14	0.06	0.93
Satisfaction–Direct	1.08[c]	0.70[b]	0.99	0.29	0.25	0.11
Indirect	0.17	-0.14	1.17	0.18	-0.11	1.28
	Results for Sorority Membership					
	First-Year			Seniors		
Engagement/Outcome Measure	2014	2017	t-value	2014	2017	t-value
Higher-Order Thinking	0.91[c]	0.58[b]	1.01	0.63[b]	0.40[a]	0.83
Reflective & Integrative Thinking	0.19	0.53[a]	-1.03	0.61[c]	0.25	1.35
Quantitative Reasoning	0.90[d]	1.04[d]	-0.47	0.83[d]	0.77[d]	0.20
Learning Strategies	0.77[b]	0.65[b]	0.38	0.76[d]	0.48[b]	1.03
Collaborative Learning	2.26[d]	2.52[d]	-0.84	1.89[d]	2.12[d]	-0.92
Diverse Discussions	0.87[a]	1.15[c]	-0.53	1.02[c]	0.97[c]	0.12
Student-Faculty Interaction	1.97[d]	2.20[d]	-0.61	1.99[d]	1.44[d]	1.67
Effective Teaching Practices	-0.18	-0.34	0.50	0.36[a]	-0.04	1.45
Quality of Interactions	0.51[a]	0.33	0.58	0.70[c]	0.29	1.48
Supportive Environment	0.91[d]	1.06[d]	-0.49	0.88[d]	0.87[d]	0.03
Perceived Learning–Direct	0.79[d]	0.70[d]	0.43	0.25[a]	0.29[b]	-0.23
Indirect	0.85[d]	0.91[d]	-0.28	0.85[d]	0.62[d]	1.12
Grades–Direct	-0.79[c]	-0.42[a]	-1.34	-1.29[d]	-1.02[d]	-1.00
Indirect	0.00	-0.05	0.78	0.17[c]	0.05	1.87
Satisfaction–Direct	0.77[b]	0.80[c]	-0.09	0.65[c]	0.42[a]	0.88
Indirect	0.33[b]	0.31[a]	0.11	0.48[d]	0.25[a]	1.35

[a]$p<0.05$; [b]$p<0.01$; [c]$p<0.001$; [d]$p<0.0001$

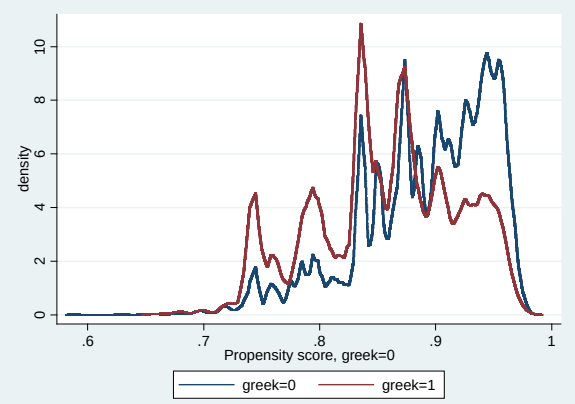
The results presented in the second sub-table also show similar patterns of relationships across the two years the survey was administered and across class levels. With the exception of

the Effective Teaching Practices engagement indicator, membership in a sorority was positively related to student engagement. In the case of Effective Teaching Practices, sorority membership was not significantly related to the engagement for first-year students in either 2014 or 2017. For seniors, sorority membership had a significant, albeit weak, positive relationship with the Effective Teaching Practices indicator in 2014, but sorority membership was not significantly related to Effective Teaching Practices in 2017. Sorority membership had positive direct and indirect relationships with both perceived learning gains and satisfaction with college for first-year and senior students across both NSSE administrations. Sorority membership had a direct negative relationship with the grades of first-year students and seniors in both years. However, the indirect relationships were generally not statistically significant. T-tests revealed no statistically significant differences in any of the coefficients for 2014 and 2017.

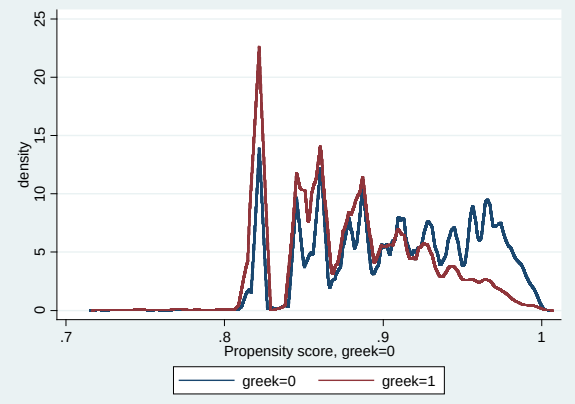
The Effects of Fraternity/Sorority Membership on Engagement and College Outcomes Using Matched Samples



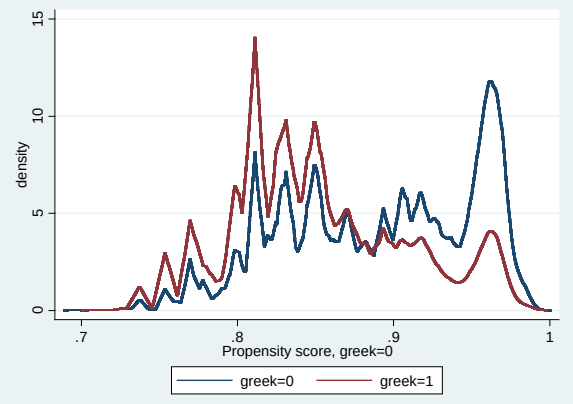
First-Year Males



Senior Males



First-Year Females



Senior Females

Figure 2: Overlap Charts of Propensity Scores

As noted earlier, membership in fraternities and sororities was significantly related to the covariates included in this study. Equally, important, there must be substantial overlap between students in Greek-letter organizations and students who are not members of those organizations. Figure 2 displays the overlap charts for first-year and senior males and for first-year and senior females. An examination of the four graphs reveals that there is sufficient overlap between the groups to permit matching on propensity scores.

One-to-one matching on propensity scores was able to match 2,471 first-year fraternity members with 2,471 other first-year students who were not members of a fraternity. Propensity score matching was also able to match 4,563 seniors in fraternities with 4,563 other seniors who were not in fraternities. Table 7 displays the standardized differences for the unmatched and matched samples for both first-year and senior students. An examination of the standardized differences for first-year students clearly shows that matching substantially reduced pre-existing differences between fraternity members and non-members. For first-year students 10 of 21 covariates in the unmatched samples had standardized differences of at least 0.10 (living on campus produced a very large difference), whereas none of the standardized differences for the matched samples approach 0.10. The pattern was similar for seniors. For the unmatched samples, 11 of 21 covariates had standardized differences of 0.10 or greater, and three covariates (non-traditional age, transfer students, and living on campus) produced extremely large standardized differences. No standardized differences for the matched samples approached 0.10.

Table 7:
Standardized Differences for First-year and Senior Males

	First-Year		Senior	
	Unmatched	Matched	Unmatched	Matched
Carnegie Classification-Master's	-0.08	-0.01	-0.11	0.01
Carnegie Classification-Baccal.	0.03	-0.01	0.13	-0.01
Carnegie Classification-Other	-0.11	0.01	-0.06	-0.01
Public Institution	0.06	-0.01	-0.10	0.01
Small Institution	0.05	-0.01	0.14	-0.01
Medium Institution	-0.11	-0.01	0.03	0.01
Large Institution	0.02	-0.01	-0.01	0.01
Asian American	-0.12	0.02	-0.09	0.01
Black	-0.19	0.02	0.05	0.01
Latinx	-0.10	-0.01	-0.06	-0.01
Multiracial	-0.02	-0.02	0.02	0.01
Other Race/Ethnicity	-0.01	0.03	-0.04	-0.01
First-Generation	-0.15	0.01	-0.15	0.01
Non-Traditional Age	-0.16	0.01	-0.41	0.01
Veteran	-0.07	0.02	-0.07	0.02
Full-Time Enrollment	0.10	-0.01	0.18	0.01
Online Enrollment	0.03	0.04	-0.13	0.02
STEM Major	-0.11	-0.01	-0.10	0.01
Transfer Student	-0.02	0.02	-0.43	0.01
Live On Campus	0.34	-0.01	0.36	0.01
Athlete	-0.01	0.01	0.05	0.03

Table 8 displays the standardized differences for the unmatched and matched samples of first-year and senior females. Here again, the results show that matching on propensity scores substantially reduced pre-existing differences between sorority members and non-members. For first-year students, standardized differences on 10 of the 21 covariates exceeded 0.10 in the unmatched samples. Very large differences were observed for Black students, first-generation students, non-traditional age students, and students living on campus. For the matched samples, none of the standardized differences approached 0.10. The results for seniors were similar. The unmatched samples produced standardized differences greater than 0.10 for 10 of 21 covariates, and very large differences were found for first-generation students, non-traditional age students, full-time enrollment, taking online courses, transfer students, and living on campus. Once again, none of the standardized differences approached 0.10 for the matched samples.

Table 8:
Standardized Differences for First-year and Senior Females

	First-Year		Senior	
	Unmatched	Matched	Unmatched	Matched
Carnegie Classification-Master's	-0.10	0.01	-0.15	-0.01
Carnegie Classification-Baccal.	-0.01	-0.01	0.12	0.01
Carnegie Classification-Other	-0.16	0.01	-0.12	-0.01
Public Institution	0.03	0.01	-0.09	-0.01
Small Institution	-0.05	-0.01	0.04	0.01
Medium Institution	-0.13	0.01	-0.01	-0.01
Large Institution	0.05	-0.01	0.01	0.01
Asian American	-0.14	0.01	-0.11	-0.01
Black	-0.31	-0.01	-0.04	0.01
Latinx	-0.17	0.01	-0.09	-0.01
Multiracial	-0.03	-0.01	-0.01	0.01
Other Race/Ethnicity	-0.03	-0.01	-0.06	0.01
First-Generation	-0.23	0.01	-0.23	0.01
Non-Traditional Age	-0.20	-0.02	-0.52	0.01
Veteran	0.01	0.02	-0.07	0.03
Full-Time Enrollment	0.17	-0.01	0.24	=0.01
Online Enrollment	-0.08	0.04	-0.21	0.01
STEM Major	-0.09	0.01	-0.01	-0.01
Transfer Student	-0.08	0.01	-0.50	0.01
Live On Campus	0.39	-0.01	0.27	0.01
Athlete	-0.06	0.01	0.01	0.01

Table 9 displays the average treatment effects on the treated (ATET) for the matched samples of first-year and senior fraternity members and non-members. Positive ATET coefficients indicate that fraternity members had higher scores than non-members. Also included in the table are rbounds estimates, which were used to evaluate the conditional independence assumption.

An examination of the ATET coefficients in Table 9 reveals results that are generally in line with the results produced by the structural equation models. First-year students who were

fraternity members had significantly higher means on 7 of 10 engagement indicators, as well as on the variable representing participation in high-impact practices. First-year fraternity members had significantly lower scores on two engagement indicators: Effective Teaching Practices and Quality of Interactions. No significant difference between fraternity members and non-members was found for the Higher-Order Thinking indicator. First-year students who were members of a fraternity also had significantly higher levels of perceived learning gains and satisfaction, although they reported significantly lower grades than did the matched sample of first-year students who were not fraternity members. The largest positive treatment effects were found for Collaborative Learning, Student-Faculty Interaction, High-Impact Practices, Discussions with Diverse Others, and perceived learning gains. For first-year students, only the average treatment effect on the treated for Collaborative Learning produced an rbounds coefficient that was moderately or highly insensitive to the effects of an unmeasured variable. Thus, it is not possible to say that the effects on student engagement and college outcomes observed for first-year students were *caused* by fraternity membership.

Table 9:
Average Treatment Effects on the Treated (ATET) and rbounds Estimates for First-Year and Senior Males

	First-Year		Senior	
Engagement/Outcome Measure	ATET	rbounds	ATET	rbounds
Higher-Order Thinking	0.39		0.45[b]	1.10
Reflective & Integrative Thinking	0.48[a]	1.10	0.68[d]	1.20
Quantitative Reasoning	0.98[d]	1.20	1.19[d]	1.30
Learning Strategies	0.67[b]	1.10	0.57[c]	1.10
Collaborative Learning	3.00[d]	1.90	2.48[d]	1.80
Discussions with Diverse Others	1.33[d]	1.30	1.24[d]	1.40
Student-Faculty Interaction	2.71[d]	1.50	1.70[d]	1.30
Effective Teaching Practices	-0.77[c]	1.20	-0.11	
Quality of Interactions	-0.80[c]	1.10	-0.55[c]	1.10
Supportive Environment	0.81[c]	1.20	0.36[a]	1.10
High-Impact Practices	1.86[d]	1.10	2.19[d]	1.50
Perceived Learning Gains	1.53[d]	1.40	0.72[d]	1.20
Grades	-1.26[d]	1.10	-1.20[d]	1.20
Satisfaction	0.72[c]	1.30	0.04	

[a]$p<0.05$; [b]$p<0.01$; [c]$p<0.001$; [d]$p<0.0001$

Seniors who were members of fraternities had significantly higher scores on 8 of 10 engagement indicators and significantly lower scores on the Quality of Interactions indicator. No significant difference was found for Effective Teaching Practices. The largest coefficients were found for Collaborative learning, High-Impact Practices, Student-Faculty Interaction, Discussions with Diverse Others, and Quantitative Reasoning. ATET coefficients for High-Impact Practices and learning gains were positive and significant, whereas the ATET coefficient for grades was negative and statistically significant. The largest positive effects were found for Collaborative Learning, High-Impact Practices, Student-Faculty Interaction, Discussions with Diverse Others, and Quantitative Reasoning. Once again, only the Collaborative Learning engagement indicator produced an rbounds estimate that approached 2.00. As a consequence, it

cannot be said with confidence that membership in a fraternity *caused* the differences observed for seniors.

Table 10:
Average Treatment Effects on the Treated (ATET) and rbounds Estimates for First-Year and Senior Females

	First-Year		Senior	
Engagement/Outcome Measure	ATET	rbounds	ATET	rbounds
Higher-Order Thinking	0.58[d]	1.10	0.24[a]	1.10
Reflective & Integrative Thinking	0.44[b]	1.10	0.23	
Quantitative Reasoning	0.86[d]	1.10	0.67[d]	1.10
Learning Strategies	0.55[c]	1.20	0.24[a]	1.10
Collaborative Learning	2.53[d]	1.70	2.10[d]	1.60
Discussions with Diverse Others	0.70[d]	1.20	0.67[d]	1.20
Student-Faculty Interaction	1.86[d]	1.30	1.50[d]	1.30
Effective Teaching	-0.33[a]	1.10	-0.11	
Quality of Interactions	0.23		0.19	
Supportive Environment	1.01[d]	1.30	0.82[d]	1.20
High-Impact Practices	0.60[d]	1.10	1.72[d]	1.50
Perceived Learning Gains	1.40[d]	1.30	0.77[d]	1.30
Grades	-0.45[c]	1.10	-0.78[d]	1.10
Satisfaction	1.20[d]	1.40	0.69[d]	1.40

[a]$p<0.05$; [b]$p<0.01$; [c]$p<0.001$; [d]$p<0.0001$

The results of the ATET tests for sorority members and non-members showed that sorority members were significantly more engaged than the matched group of non-members. Among first-year students sorority members had significantly higher means on 8 of 10 engagement indicators. First-year sorority members had a lower mean score for Effective Teaching Practices, and there was no difference in the means for sorority members and non-members on Quality of Interactions. First-year sorority members had significant higher mean scores than non-members on perceived learning gains and satisfaction with college, but a lower mean for grades. The largest treatment effects were found for the Collaborative Learning, Student-Faculty Interaction, perceived learning gains, satisfaction, and Supportive Environment measures. The rbounds estimates for all first-year engagement and outcome variables were weak to moderate. Thus, it is not possible to say with confidence that membership in a sorority is causally related to either student engagement or college outcomes.

Results for seniors were similar to those for first-year students, but generally less strong. Sorority members had significantly higher means on 7 of 10 engagement indicators. No significant differences were found for Reflective and Integrative Thinking, Effective Teaching Practices, and Quality of Interactions, but sorority members had significantly higher levels of engagement with High-Impact Practices. They also had higher means scores for perceived learning gains and satisfaction with college, but a lower mean for grades. The largest treatment effects were observed for Collaborative Learning, participating in High-Impact Practices, and Student-Faculty Interaction. Once again, the rbounds estimates were weak to moderate, and it is not possible to say that the observed differences were *caused* by membership in a sorority.

Limitations

The results of this research are limited in several important ways. First, the findings of this study are limited to those students who completed the NSSE questionnaires in 2014 and 2017. Had different institutions and/or different students participated in the surveys, the results may have differed in unknown ways. The findings of this study are also limited to the years in which the NSSE survey was administered. Although the results of the cross-validation analyses indicated that the results tended to be very stable across years, an analysis of survey responses from different years could have produced different results.

The findings of the study are also limited to the items on the NSSE survey that were used to create engagement and outcome measures. Research has consistently supported the adequacy and appropriateness of the items used in NSSE. Nevertheless, it is possible that surveys using different item sets could produce different results. Because of the question used to identify fraternity/sorority members, it is not possible to identify whether the students were members in historically Black or historically white Greek-letter organizations. Given the relatively small number of Black student in fraternities and sororities, it seems unlikely that this is a major limitation of the research, but it is a limitation. Finally, and most importantly, the results of this research show that membership in a fraternity or sorority is related to a variety of types of student engagement and college outcomes. However, this research cannot answer the questions of why or how fraternity/sorority membership is related to engagement and outcomes. Additional, qualitative research is needed to better understand how fraternities and sororities engage and influence their members.

Discussion

Despite these limitations, the results of this research have important implications for research and practice. A strength of this research is the fact that the NSSE surveys provide data that is representative of the vast majority of students in colleges and universities across the United States. One of the findings to emerge from this study is a clear portrait of the background characteristics of fraternity/sorority members and non-members. The study found few differences in the types of colleges and universities that fraternity/sorority members and non-members attend. Not surprisingly, few members of fraternities or sororities attended special mission institutions (i.e., Carnegie-Other), such as art institutes, music conservatories, and military academies. In fact, few of these institutions have fraternity or sorority chapters. Fraternity/sorority members were also slightly less likely to attend Master's institutions and more likely to attend doctoral/research universities.

The greatest differences between fraternity/sorority members and nonmembers were found for their demographic and enrollment characteristics. In the present research, members of fraternities and sororities tended to resemble the conventional wisdom regarding who is a typical college student. Compared to students who were not members of Greek-letter organizations, fraternity/sorority members were more likely to be white and less likely to be Asian American, Black, or Latinx. Members of fraternities or sororities were less likely to be the first in their families to go to college or be 24 years of age or older (i.e., non-traditional age). Fraternity and sorority members were also less likely to major in a STEM discipline, and seniors in Greek-letter organizations were less likely to be transfer students. Members of fraternities and sororities, both first-year students and seniors, were more likely than non-members to live on campus.

Taking into account the differences between fraternity/sorority members and non-members, six findings emerged from the present study. First and foremost, membership in a fraternity or sorority was associated with significantly higher levels of student engagement in educationally purposeful activities. Although previous research on fraternity/sorority membership and student engagement produced equivocal results, the findings of this research were very consistent and positive. Members of fraternities and sororities had significantly higher levels of engagement on 8 of the 10 engagement measures, and they reported more frequent participation in high-impact practices. The positive relationships between fraternity/sorority membership and engagement were strongest for the Collaborative Learning and Student-Faculty Interaction engagement indicators. Similar results were reported by Bureau et al. (2011) and Hayek et al. (2002). The present research also found that the relationship between membership in a fraternity or sorority and engagement was moderated by class standing (i.e., being a first-year or senior student). For three engagement indicators—Collaborative Learning, Student-Faculty Interaction, and Supportive Campus Environment—the observed relationships were stronger for first-year students than seniors. Similar results were reported by Pike (2003).

A particularly noteworthy finding of this study concerned the diversity experiences of fraternity/sorority members. Previous studies have noted that fraternities and sororities are very homogeneous in terms of race/ethnicity and social class (Hamilton & Cheng, 2018; Maisel, 1990, Park, 2008). These studies also found that members of fraternities and sororities have fewer interactions with students who are different from themselves (Asel, Seifert, & Pascarella, 2009; Porter, 2012; Williams & Johnson, 2011). This study also found that members of fraternities and sororities were more homogeneous than the general student population. However, the results of this research indicated that fraternity/sorority members reported significantly higher levels of Discussions with Diverse Others than independent students, net the effects of background and enrollment characteristics. Moreover, the relationship was strongest for fraternity members.

The second finding to emerge from this study concerns the relationship between fraternity/sorority membership and student learning outcomes. Previous research on the relationships between membership in a fraternity or sorority and learning outcomes produced mixed results, irrespective of whether the learning outcome measures were objective test scores or students' self-reports. Earlier research also found that membership in a fraternity or sorority was more positively related to learning outcomes for students in the second, third, or fourth year of college (Pascarella, Flowers, & Whitt, 2001; Pike, 2003). This finding led some researchers to suggest that membership in a fraternity or sorority be deferred until the second semester or second year of college (Pascarella, Flowers, & Whitt, 2001). The findings of the current study sharply contradict the results of previous studies. Fraternity/sorority membership was directly, positively, and significantly related to learning gains for first-year students, but not for seniors. Significant positive indirect relationships, acting through student engagement, were found for both first-year students and seniors in fraternities and sororities. This finding is consistent with results reported by Pike (2000) and demonstrates the importance of student engagement to the learning outcomes of college.

A third finding of the present research is the negative relationship between grades in college and fraternity/sorority membership. Specifically, membership in a Greek-letter organization was negatively related to self-reported grades in college for both men and women and for both first-year and senior students. These findings are consistent with the findings of studies by Asel,

Seifert, and Pascarella (2009) and Bureau et al. (2011), and differed sharply from studies showing positive relationships between Greek affiliation and grades (Ahren et al., 2014; DeBard & Sacks, 2010) or no relationship at all (Nelson et al., 2006; Pike & Askew, 1990). On surprising finding given research showing a positive relationship between student engagement and grades (Kuh et al., 2006; Pike & Askew, 1990), was the absence of strong, positive indirect relationships between fraternity/sorority membership and grades. A second surprising finding was the fact that the negative relationship between membership in a fraternity or sorority and grades was stronger for seniors than first-year students. This result stands in sharp contrast to the findings of DeBard, Lake, and Binder (2006), DeBard and Sacks (2010), and Nelson et al. (2006). The negative relationships between fraternity/sorority membership and grades were also stronger for men than women.

A fourth finding of the present research is that fraternity/sorority membership was positively related to satisfaction with college. This finding was consistent with the results reported by Pike and Askew (1990), but it was not consistent with results reported by Walker, Martin, and Hussey (2015). It is also important to note that membership in a sorority had a positive indirect relationship with satisfaction, acting through student engagement, but membership in a fraternity did not.

The fifth finding to emerge from this study is that the results of the cross-validation analysis showed remarkable stability across years, for both males and females. Only one statistically significant ($p < 0.05$) difference in the results for 2014 and 2017 was identified, and that difference was relatively small (i.e., less than one-tenth of a standard deviation). Given that 64 cross-validation tests were conducted, it would be reasonable to expect three or four statistically significant differences would emerge by chance alone, given a critical value of $p < 0.05$.

Finally, the average treatment effects on the treated (ATET), obtained using propensity score matching, closely paralleled the results obtained using structural equation modeling. This is not surprising given that propensity score matching used the same covariates as structural equation modeling. However, this does not indicate that the propensity score matching did not contribute to an understanding of the effects of fraternity/sorority membership. Important findings emerged from the sensitivity analysis regarding conditional independence and causality. Specifically, the results of the sensitivity analysis failed to provide strong evidence of conditional independence and a causal relationship between fraternity/sorority membership and student engagement, learning outcomes, grades, and satisfaction. In other words, variables that were not included in this study could have substantively altered the findings of this study. Although it may be disappointing that it cannot be said that fraternity/sorority membership *caused* students to be more engaged, learn more, and be more satisfied, it is also true that the results to not conclusively demonstrate that membership in a fraternity or sorority *caused* students to have lower grades.

Implications for Future Research

As previously noted, the findings of the current research have important implications for future research on the effects of fraternity/sorority membership. Perhaps the most important implication of this study is that more research is needed. As noted in the introduction to this report, the effects of membership in a fraternity or sorority on college students' experiences and outcomes has been an under-researched topic. Research is needed to confirm the findings of the current study. Research is also needed to better understand the findings of this research. In many

ways it is easy to understand how fraternity/sorority membership encourages engagement in educational activities. After all, membership in a Greek-letter organization is itself a form of engagement, and the values of fraternities and sororities stress the importance of interaction and collaboration with peers. These values also stress the importance of service.

Given the strong positive relationships between fraternity/sorority membership and a broad array of engagement indicators, it is important to delve into the absence of positive relationships for two engagement indicators—Effective Teaching Practices and Quality of Interactions. The survey items used to represent Effective Teaching Practices indicator all relate to instructors' classroom behaviors (e.g., being well organized, clearly explaining concepts, and providing prompt feedback). It is not clear why fraternity/sorority members would be more critical of their instructors than other students. The survey items representing the Quality of Interactions indicator ask students to characterize their interactions with other students, faculty, administrators, and staff. Again, it is not clear why these interactions would be more negative for members of fraternities or sororities. One possible explanation is that the negative reputations of fraternities and sororities on come college campuses color the interactions fraternity/sorority members have with others on those campuses. This topic is deserving of further research.

Another relationship between fraternity/sorority membership and student engagement that deserves additional research is the positive relationship between membership in a fraternity or sorority and diversity experiences. Previous research indicated that fraternities and sororities are less diverse and that members of fraternities and sororities interact less frequently with individuals who are different from themselves. Research is need to better understand why the results of this study indicate fraternity/sorority members interact more frequently with individuals who are different than themselves. One possible explanation is that previous research focused on racial/ethnic diversity, whereas the definition of diversity was broader in this study (e.g., interacting with people from different race/ethnic groups, different religions, different political orientations, etc.). It is also possible that the positive relationships in the current research are an outgrowth of the strong community service orientations of fraternities and sororities. A better understanding of these results is critical for improving fraternity/sorority members' experiences with diversity, equity, and inclusion.

It is not surprising that fraternity/sorority membership is associated with higher levels of student engagement. However, it is less clear why membership in a fraternity or sorority is associated with lower grades. The negative relationship between grades and membership in a fraternity or sorority is particularly surprising, given the positive relationship between grades and student engagement (Kuh et al., 2006). Perhaps the negative effect on grades is the result of fraternity/sorority members becoming over extended. Previous studies have suggested that members of fraternities or sorority spend too much time in social activities and too little time in academic pursuits (Kuh, Pascarella, & Wechsler, 1996). This explanation does not appear to be appropriate for the findings of the present research. Fraternity and sorority members reported higher levels of higher-order thinking, reflective and integrative learning, and collaborative learning than independent students. If Greek students are becoming over-extended, they appear to be over committed in academic as well as social areas.

Some of the research that is needed will require more detailed and focused quantitative analyses in order to better understand what factors are contributing to the findings observed in the present research. At the same time, it is important that researchers conduct qualitative studies

to understand how students experience fraternity/sorority life and the meanings they construct from those experiences. Although qualitative research may be limited to what students believe to be important points of influence, this data would provide much more information than what is currently available.

Implications for Practice

The results of the current study also have important implications for the leadership of Greek-letter organizations, both on college campuses and in national organizations. First and foremost, this research clearly indicates that fraternities and sororities are not antithetical of the values of American higher education. Fraternities and sororities do appear to "walk their talk," encouraging students to become both academically and socially engaged, value learning, and be more satisfied with their college experiences. As a consequence, local fraternities and sororities, as well as their national organizations, should communicate the positive benefits of sorority membership to senior college and university administrators, as well as the public at large.

That said, there are several opportunities to improve the fraternity/sorority experiences of college students. It is imperative that Greek-letter organizations, in cooperation with colleges and universities, take effective steps to address issues related to alcohol use and abuse, hazing, and sexual assault. To be fair, these issues are not unique to fraternities and sororities. However, fraternities and sororities have become associated with these problems in the public's mind. Failure to address these issues will allow critics who advocate banning fraternities and sororities from college campuses to dominate the conversation (see Biddix et al., 2014). The academic and social benefits of fraternity/sorority membership are too important to be lost.

The results of this study also argue against policies that defer membership in a fraternity or sorority until the second semester or the second year of college. Fraternity/sorority membership had the largest positive effects for first-year students in the areas of collaborative learning with other students, interactions with faculty members, and self-reported gains in learning. Even the negative relationship between fraternity/sorority membership and grades tended to be smaller for first-year students than seniors. These findings are particularly important given that the quality of students' first-year experiences have a profound effect on success throughout college (Hunter, 2006).

Another implication of these research findings for practice concerns the role of fraternities and sororities in promoting diversity, equity, and inclusion. Popular perceptions, along with some previous research, hold that fraternities and sororities tend to be elitist organizations that do not encourage their members to interact with people who are different from themselves (Asel, Seifert, & Pascarella, 2009; Hamilton & Cheng, 2018; Maisel, 1990 Porter, 2012; Park, 2008; Williams & Johnson, 2011). The present research found that fraternity/sorority membership was positively related to interacting with diverse others, net the effects of other background characteristics. More research is needed to understand why the results of this study contradicted the findings of previous research. Nevertheless, fraternities and sororities can take actions now to promote diversity, equity, and inclusion through interactions with diverse others. One obvious way for fraternity/sorority members to interact with other is participation in service projects that are developed in collaboration with underserved communities.

One concerning finding to emerge from this study was the negative relationship between membership in a fraternity or sorority and students' grades. Here again, the factors underlying

this relationship are unclear, and more research is needed. One possible explanation is that fraternity/sorority members become over-extended due to their high levels of curricular and cocurricular engagement. It may be worthwhile for national organizations and local chapters to consider using support systems similar to those provided for college athletes. Members of fraternities and sororities, like college athletes, must deal with multiple demands on their time. The support systems developed to help athletes cope with and manage demands on their time may be useful for fraternity/sorority members (Broughton & Neyer, 2001; Rothschild-Checroune, Gravelle, Dawson, & Karlis, 2013). Given the positive influences of membership in a fraternity or sorority, it is important that those benefits are not offset by poor academic performance.

Conclusion

All too often, it is taken for granted that that fraternities and sororities are social organizations that do little to help their members succeed academically. The present research call this conventional wisdom into question. Based on both the NSSE 2014 and NSSE 2017 data analyzed in this study, it appears that fraternity and sorority members are more engaged, report greater learning gains, and are more satisfied than students who are not members of fraternities or sororities. Although fraternity/sorority members report having lower grades than non-members, it does not appear that these lower grades are a result of a lack of effort in their academic studies. Moving forward, colleges and universities, national organizations, and local fraternity/sorority chapters need to take steps to address negative aspects of fraternity/sorority life so that students can fully realize the many benefits of being members in a fraternity or sorority.

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Appendix A:
Descriptive Statistics for the First-Year and Senior/Male and Female Samples for NSSE 2014

	Males		Females	
	First-Year (n=13,946)	Senior (n=23,086)	First-Year (n=28,183)	Senior (n=40,610)
Fraternity/Sorority Member	0.09	0.12	0.09	0.11
Carnegie Classification-Doctoral	0.34	0.39	0.31	0.32
Carnegie Classification-Master's	0.39	0.40	0.43	0.46
Carnegie Classification-Baccal.	0.25	0.19	0.23	0.19
Carnegie Classification-Other	0.02	0.02	0.03	0.03
Public Institution	0.63	0.68	0.60	0.66
Asian American	0.06	0.06	0.06	0.05
Black	0.08	0.07	0.09	0.09
Latinx	0.12	0.11	0.11	0.11
Multiracial	0.03	0.02	0.04	0.03
Other Race/Ethnicity	0.01	0.01	0.01	0.01
White	0.69	0.73	0.69	0.72
First-Generation	0.28	0.30	0.31	0.34
Non-Traditional Age	0.04	0.36	0.03	0.28
Veteran	0.03	0.08	0.01	0.02
Full-Time Enrollment	0.98	0.86	0.96	0.86
Online Enrollment	0.01	0.04	0.01	0.05
STEM Major	0.48	0.40	0.42	0.33
Transfer Student	0.08	0.42	0.07	0.40
Live On Campus	0.69	0.19	0.72	0.19
Athlete	0.13	0.07	0.09	0.05
Higher-Order Thinking	39.12	40.36	40.25	42.44
Reflective & Integrative Thinking	35.79	38.25	36.44	40.40
Quantitative Reasoning	30.12	33.11	25.34	27.85
Learning Strategies	38.14	38.32	40.83	41.28
Collaborative Learning	33.37	34.36	33.54	34.01
Discussions with Diverse Others	41.18	40.94	41.05	42.01
Student-Faculty Interaction	21.23	25.22	20.77	26.08
Effective Teaching Practices	40.50	40.75	40.68	41.97
Quality Interactions	42.72	42.44	41.84	43.08
Supportive Environment	37.42	33.76	39.57	35.34
Learning Gains	34.82	38.50	35.31	39.78
Grades	5.95	6.09	6.23	6.38
Satisfaction	6.49	6.51	6.60	6.64

Descriptive Statistics for the First-Year and Senior/Male and Female Samples for NSSE 2017

	Males		Females	
	First-Year (n=19,554)	Senior (n=27.259)	First-Year (n=40,328)	Senior (n=49,194)
Fraternity/Sorority Member	0.08	0.11	0.09	0.12
Carnegie Classification-Doctoral	0.45	0.47	0.39	0.40
Carnegie Classification-Master's	0.36	0.37	0.41	0.42
Carnegie Classification-Baccal.	0.18	0.15	0.18	0.16
Carnegie Classification-Other	0.01	0.01	0.02	0.02
Public Institution	0.66	0.72	0.65	0.70
Asian American	0.08	0.08	0.06	0.07
Black	0.08	0.07	0.10	0.08
Latinx	0.14	0.13	0.15	0.13
Multiracial	0.04	0.04	0.04	0.04
Other Race/Ethnicity	0.01	0.01	0.01	0.01
White	0.65	0.68	0.64	0.67
First-Generation	0.28	0.31	0.32	0.34
Non-Traditional Age	0.03	0.34	0.03	0.26
Veteran	0.02	0.07	0.01	0.02
Full-Time Enrollment	0.96	0.85	0.96	0.86
Online Enrollment	0.02	0.05	0.02	0.07
STEM Major	0.42	0.38	0.22	0.18
Transfer Student	0.08	0.42	0.07	0.40
Live On Campus	0.69	0.19	0.73	0.19
Athlete	0.12	0.07	0.08	0.06
Higher-Order Thinking	38.12	39.53	38.92	40.99
Reflective & Integrative Thinking	34.97	37.39	36.14	39.63
Quantitative Reasoning	30.05	33.03	25.69	27.92
Learning Strategies	36.86	36.68	39.61	39.33
Collaborative Learning	33.47	35.13	33.88	34.55
Discussions with Diverse Others	39.89	40.19	40.16	40.90
Student-Faculty Interaction	21.14	25.14	20.98	25.59
Effective Teaching Practices	39.24	39.50	39.13	40.47
Quality Interactions	42.38	41.66	41.75	42.12
Supportive Environment	36.40	32.70	38.04	34.16
Learning Gains	34.92	38.45	35.41	39.89
Grades	6.05	6.16	6.27	6.45
Satisfaction	6.43	6.44	6.54	6.63

Appendix B:
Items Comprising the NSSE Engagement Indicators, High-Impact Practices, Learning Gains, and Satisfaction Scales

Higher-Order Learning (First-year $\alpha = 0.84$; Senior $\alpha = 0.84$)

During the current school year, how much has your coursework emphasized the following…

- Applying facts, theories, or methods to practical problems or new situations.
- Analyzing an idea, experience, or line of reasoning in depth by examining its parts.
- Evaluating a point of view, decision, or information source.
- Forming a new idea of understanding from various pieces of information.

Reflective and Integrative Learning (First-year $\alpha = 0.85$; Senior $\alpha = 0.87$)

During the current school year, how often have you…

- Combined ideas from different courses when completing assignments.
- Connected your learning to societal problems or issues.
- Included diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments.
- Examined the strengths and weaknesses of your own views on a topic or issue.
- Tried to better understand someone else's views by imagining how an issues looks from his or her perspective.
- Learned something that changed the way you understood an issue or concept.
- Connected ideas from your courses to your prior experiences and knowledge.

Learning Strategies (First-year $\alpha = 76$; Senior $\alpha = 0.77$)

During the current school year, how often have you…

- Identified key information from reading assignments.
- Reviewed your notes after class.
- Summarized what you learned in class or from course materials.

Quantitative Reasoning (First-year $\alpha = 0.82$; Senior $\alpha = 0.83$)

During the current school year, how often have you…

- Reached conclusions based on your own analysis of numerical information (numbers, graphs, statistics, etc.).
- Used numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.).
- Evaluated what others have concluded from numerical information.

Collaborative Learning (First-year α = 0.82; Senior α = 0.82)

During the current school year, how often have you…

- Asked another student to help you understand course material.
- Explained course material to one or more students.
- Prepared for exams by discussing or working through course material with other students.
- Worked with other students on course projects or assignments.

Discussions with Diverse Others (First-year α = 0.86; Senior α = 0.89)

During the current school year, how often have you had discussions with people from the following groups…

- People from a race or ethnicity other than your own.
- People from an economic background other than your own.
- People with religious beliefs other than your own.
- People with political views other than your own.

Student-Faculty Interaction (First-year α = 0.82; Senior α = 0.84)

During the current school year, how often have you…

- Talked about career plans with a faculty member.
- Worked with a faculty member on activities other than coursework (committees, student groups, etc.).
- Discussed course topics, ideas, or concepts with a faculty member outside of class.
- Discussed your academic performance with a faculty member.

Effective Teaching Practices (First-year α = 0.84; Senior α = 0.86)

During the current school year, to what extent have your instructors done the following…

- Clearly explained course goals and requirements.
- Taught course sessions in an organized way.
- Used examples or illustrations to explain difficult points.
- Provided feedback on a draft or work in progress.
- Provided prompt and detailed feedback on tests or completed assignments.

Quality of Interactions (First-year α = 0.86; Senior α = 0.83)

Indicate the quality of your interactions with the following people at your institution…

- Students.
- Academic advisors.
- Faculty.
- Student services staff (career services, student activities, housing, etc.).

Supportive Campus Environment (First-year $\alpha = 0.88$; Senior $\alpha = 0.88$)

How much does your institution emphasize the following…

- Providing support to help students succeed academically.
- Using learning support services (tutoring services, writing center, etc.).
- Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.).
- Providing opportunities to be involved socially.
- Providing support for your overall well-being (recreation, health care, counseling, etc.).
- Helping you manage your non-academic responsibilities (work, family, etc.).
- Attending campus activities and events (performing arts, athletic events, etc.).
- Attending events that address important social, economic, or political issues.

High-Impact Practices

Which of the following have you done…

- Participate in a learning community or some other formal program where groups of students take two or more classes together.
- Participate in an internship, co-op, field experience, student teaching, or clinical placement.
- Participate in a study abroad program.
- Work with a faculty member on a research project.
- Complete a culminating senior experience (capstone course, senior project or thesis, comprehensive exam, portfolio, etc.).

Gains in Learning (First-year $\alpha = 0.91$; Senior $\alpha = 0.91$)

How much has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas…

- Writing clearly and effectively.
- Speaking clearly and effectively.
- Thinking critically and analytically.
- Analyzing numerical and statistical information.
- Acquiring job- or work-related knowledge and skills.
- Working effectively with others.
- Solving complex real-world problems.
- Developing or clarifying a personal code of values and ethics.
- Understanding people of other backgrounds (economic, racial/ethnic, political, religious, nationality, etc.).
- Being an informed and active citizen.

Satisfaction with College (First-year $\alpha = 0.76$; Senior $\alpha = 0.81$)

- How would you evaluate your entire educational experience at this institution?
- If you could start over again, would you go to the *same institution* as you are now attending?