

Sorority Membership and Educational Outcomes: Results from a National Study

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Abstract

This report communicates the results of a national, large-scale analysis of postsecondary outcomes related to membership in a National Panhellenic Conference (NPC) sorority completed in 2014. Data include student records ($n = 4243$) from the 2007 cohort of NPC members and nonmembers across 18 randomly selected four-year institutions, stratified by institutional size and setting. Results from the study focused on four primary outcomes: (1) retention to sophomore year, (2) overall graduation rate, (3) time to degree, and (4) final GPA.

Findings from descriptive analyses revealed a significant and positive link between membership and three of the four outcomes. Sorority members returned for their sophomore year, graduated college within six years, and graduated “on time” in four years at higher rates than nonmembers. Findings from predictive analysis showed the positive effect of joining on these outcomes, after controlling for pre-college background and institutional characteristics associated with study outcomes.

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Key Findings

The sample approximated the population of NPC member campuses in terms of institutional size, percentage of students living on campus, and whether the institution was public or private.

Educational Outcomes

Retention Rate

Sorority members (**93%**) were retained from freshman to sophomore year at a higher rate than nonmembers (82%).

After accounting for pre-college characteristics, such as high school GPA and ACT score, as well as institutional differences, the likelihood of retaining was **3 times higher** for sorority members.

Graduation Rate

Sorority members (**84%**) graduated within six years at a higher rate than nonmembers (71%).

After accounting for pre-college characteristics, such as high school GPA and ACT score, as well as institutional differences, the likelihood of graduating within six years was **nearly 2.5 times higher** for sorority members.

“On Time” Graduation

Sorority members (**58%**) graduated “on time” in four years at a higher rate than nonmembers (46%).

After accounting for pre-college characteristics, such as high school GPA and ACT score, as well as institutional differences, the likelihood of graduating “on time” in four years was **nearly 2 times higher** for sorority members.

Final College GPA

Sorority membership **did not affect** final college GPA.

Introduction

Research findings supporting the positive impact of involvement in a sorority on college retention and persistence have remained consistent for over two decades (Astin, 1993; DeBard & Sacks, 2011; Nelson et al., 2006; Severtis & Christie-Mizell, 2007). For example, researchers exploring the educational impact of sorority affiliation have found no significant differences between members and non-members on GPA (Grubb, 2006; Pritchard & Wilson, 2003), critical thinking, (Martin, et al., 2011), or academic engagement (Asel et al., 2009; Pike, 2000). Aside from these examples, the majority of researchers examining associations between sorority involvement and postsecondary outcomes have seldom differentiated sorority or fraternity membership, even minimally by gender (Biddix, Matney, Norman, & Martin, 2014). Fewer still have considered differences by organizing council or other characteristics. Further, with the exception of Pascarella et al. (1996), Pascarella, et al. (2001), Martin et al. (2011), Pike (2003), and DeBard and Sacks (2011), most researchers exploring the educational effects of membership did so in single-institution contexts using a cross-sectional approach.

Overall, this suggested the need for further, more precise and broader research about the effects of sorority membership on educational outcomes. A major recommendation Biddix et al. (2014) offered was the need for additional studies using large, but focused, samples generated through sound selection strategies. Large scale, multi-institutional and longitudinal postsecondary surveys such as the CIRP Freshmen Survey paired with the College Senior Survey, the National Survey of Student Engagement and the Wabash National Study of Liberal Arts Education offer a sorority/fraternity membership variable that might be used to evaluate outcomes. However, at present, neither these nor other large national datasets allow researchers to disaggregate members by organizational council (e.g., NPC, NPHC, NALFO, NIC), limiting our ability to grasp the nuanced effects of sorority membership on educational outcomes. The present study was designed specifically to address these recommendations and to account for some of the previous limitations.

Significance of the Study

National aggregates from 2000-2012 show approximately 12% of entering first-time, full-time women join a sorority (HERI, 2013). In 2011, NPC (2012) listed 26 member organizations with approximately 3,078 chapters located on 658 campuses with more than 300,000 members. Research has linked sorority membership with multiple educational and psychosocial outcomes as well as benefits to institutions such as increased retention and alumni giving rates. Current research has not accounted for specific membership in an NPC sorority or the potential impact of recruitment timing. Results from this empirical study can be used to inform policy and practice recommendations for working with and supporting undergraduate members, member organizations, regional and chapter advisory councils, partner institutions and campus professionals.

Research Questions

1. How is joining an NPC sorority associated with retention rate, as compared to nonmembers?
2. How is NPC sorority membership associated with six-year graduation rate, as compared to nonmembers?
3. How is NPC sorority membership associated with time to degree, as compared to nonmembers?
4. How is NPC sorority membership associated with a final college GPA, as compared to nonmembers?

Theoretical Framework

Astin's (1973) Input-Environment-Output (IEO) model was used as a theoretical framework. The model is particularly appropriate and widely used when examining environment and involvement effects. "Input" refers to the experiences and characteristics students have prior to attending college. "Environment" refers to the interaction of the students with all of the component parts of the college experience, including co-curricular activities. "Output" refers to the end results, including whether a degree is attained and on what timeline. The IEO model, and resulting research, provides a foundation for understanding findings regarding sorority membership and its influences, as well as many of the confounding factors. Drawing on the model, this study accounted for pre-college differences (Input) and institutional characteristics (Environment 1), to evaluate the impact of joining a sorority (Environment 2), on educational outcomes (Output).

Organization of the Study

The next section details the demographic characteristics of the sample. The five subsequent sections relate the results of the study, organized by research questions. Comparisons to national trends are presented, when available. The appendix contains a detailed methodology inclusive of sampling procedures, analyses, and limitations of the study.

About the Sample

The sample informing this study was designed to approximate the population of NPC partner institutions. The first set of tables shows comparisons based on institutional size, setting, and control. The second set of tables shows comparisons to national averages based on two educational outcomes, freshman to sophomore retention and graduation rate. National averages for 4-year and 5-year graduation rates and final college GPA were not available. The third set of tables shows comparisons of student characteristics to national averages for federal grants and loans received as well as residency status.

Sample and NPC Population

The following tables show comparisons between the sample and the population by Carnegie Classifications for institutional size, setting, and control. Size categories are based on total number of students at an institution. Setting categories are based on the percentage of undergraduates who live on campus. Control refers to whether the institution is public or private. Percentages for all three categories were comparable between the sample and actual percentages in the population.

TABLE 1. COMPARISON OF THE SAMPLE AND POPULATION BY SIZE OF INSTITUTION

SIZE CATEGORY	PERCENT OF INSTITUTIONS (TOTAL # OF INSTITUTIONS)	
	This Study (18)	Actual (658)
Large 4-year	38.9	33.3
Medium 4-year	33.3	36.8
Small 4-year	16.7	21.3
Very Small 4-year	11.1	2.7
Other*		5.9

*total of 39 other, mostly Canada and Specialized Schools, Not Classified

TABLE 2. COMPARISON OF THE SAMPLE AND POPULATION BY INSTITUTIONAL SETTING

SETTING CATEGORY	% OF INSTITUTIONS (TOTAL # OF INSTITUTIONS)	
	This Study (18)	Actual (658)
Primarily Residential	33.3	27.1
Highly Residential	50.0	42.1
Primarily Non-residential	16.7	24.9
Other*		5.9

*total of 39 other, mostly Canada and Specialized Schools, Not Classified

TABLE 3. COMPARISON OF THE SAMPLE AND POPULATION BY CONTROL

	% OF INSTITUTIONS (TOTAL # OF INSTITUTIONS)	
	This Study (18)	Actual (658)
Public	61.1	53.0
Private	38.9	41.1
Other*		5.9

*total of 39 other, mostly Canada and Specialized Schools, Not Classified

Sample Educational Outcomes and National Averages

The following tables show comparisons of educational outcomes in the sample to national averages for four-year institutions. To account for higher retention and graduation rates by control, public and private institutions are differentiated. Percentages for both outcomes were higher in the sample than national averages. This was expected since half the sample was comprised of sorority members, who tend to exhibit higher educational outcomes when compared to all students. National averages for retention rate are inclusive of all students while graduation rates are for women only. National averages for 2007 were not available for graduation rate at the time of study; however, previous year rates are comparable.

TABLE 4. FIRST-YEAR RETENTION (IN PERCENT) COMPARED TO THE NATIONAL AVERAGE

	This Study (17*)	2007 National Average**
4-year Institutions	87.5	76.5
Public	87.9	78.0
Private	86.3	79.5

*Does not include one institution because recruitment occurs during the sophomore year

**Source: U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics Table 326.20 (2013); http://nces.ed.gov/programs/digest/d13/tables/dt13_326.30.asp

TABLE 5. GRADUATION RATE (IN PERCENT) COMPARED TO THE NATIONAL AVERAGE FOR WOMEN

	This Study (18)	National 2006 Cohort*
4-year Institutions	77.7	61.4
Public	76.9	59.6
Private	78.3	67.6

**Source: U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics Table 326.10 (2013); http://nces.ed.gov/programs/digest/d13/tables/dt13_326.10.asp

Sample Student Characteristics and National Averages

The following tables show the comparisons of student characteristics in the sample to national averages for four-year institutions. Federal grants and loans received were used as a proxy for expected family contribution in the study to account for hypothesized lower federal aid and loans received among sorority members. As expected, sample rates were lower than national averages on both measures. The sample also included slightly more in- and fewer out-of-state students. National averages for 2007 were not available for residency at the time of study; however, previous year rates are comparable.

TABLE 6. FEDERAL GRANTS RECEIVED BY STUDENTS IN THE SAMPLE (IN PERCENT) COMPARED TO THE NATIONAL AVERAGE

FEDERAL GRANTS RECEIVED*	This Study	2007-2008 National Average**
No	81.4	65.5
Yes	15.7	34.5
N (# of students)	4121	-

*During the first year enrolled

**Source: 4-year Public and Private Title IV institutions, Integrated Postsecondary Education Database, 2008

TABLE 7. FEDERAL LOANS RECEIVED BY STUDENTS IN THE SAMPLE (IN PERCENT) COMPARED TO THE NATIONAL AVERAGE

FEDERAL AID RECEIVED**	Federal Loans	2007-2008 National Average**
No	64.9	44.2
Yes	32.2	55.8
N (# of students)	4121	-

*During the first year enrolled

**Source: 4-year Public and Private Title IV institutions, Integrated Postsecondary Education Database, 2008

TABLE 8. IN- AND OUT- OF STATE STATUS OF STUDENTS IN THE SAMPLE (IN PERCENT)

	This Study	2006 National Average*
In-State	62.8	52.7
Out-of-State (and International)	37.0	47.3
N (# of students)	4233	1,002,582

*Source: U.S. Department of Education, National Center for Education Statistics, Digest of Education Statistics Table 223 (2008);

http://nces.ed.gov/programs/digest/d08/tables/dt08_223.asp

Retention Rate

Freshman to sophomore retention rate was examined using two separate statistical analyses, based on different goals for the outcomes. Chi square analysis was used to examine differences in overall percentages. Logistic regression was used to investigate predictive effects.

Overall

Comparison between NPC members and nonmembers revealed a higher (+10.7%) freshman to sophomore retention rate for members. The result was statistically significant $\chi^2(1, N = 4243) = 109.58, p < .001, \phi = .161$, suggesting further sampling within this population would yield a similar difference.

TABLE 9. FIRST-YEAR RETENTION RATE BY MEMBERSHIP STATUS

1ST YEAR RETENTION	2007 National Average*	PERCENT OF STUDENTS (# OF STUDENTS)	
		Sorority Member	Non-Member
Retained	78.5	92.5 (1947)	81.8 (1749)
Not retained	21.5	7.5 (157)	18.2 (390)
Total # of Students	-	2104	2139

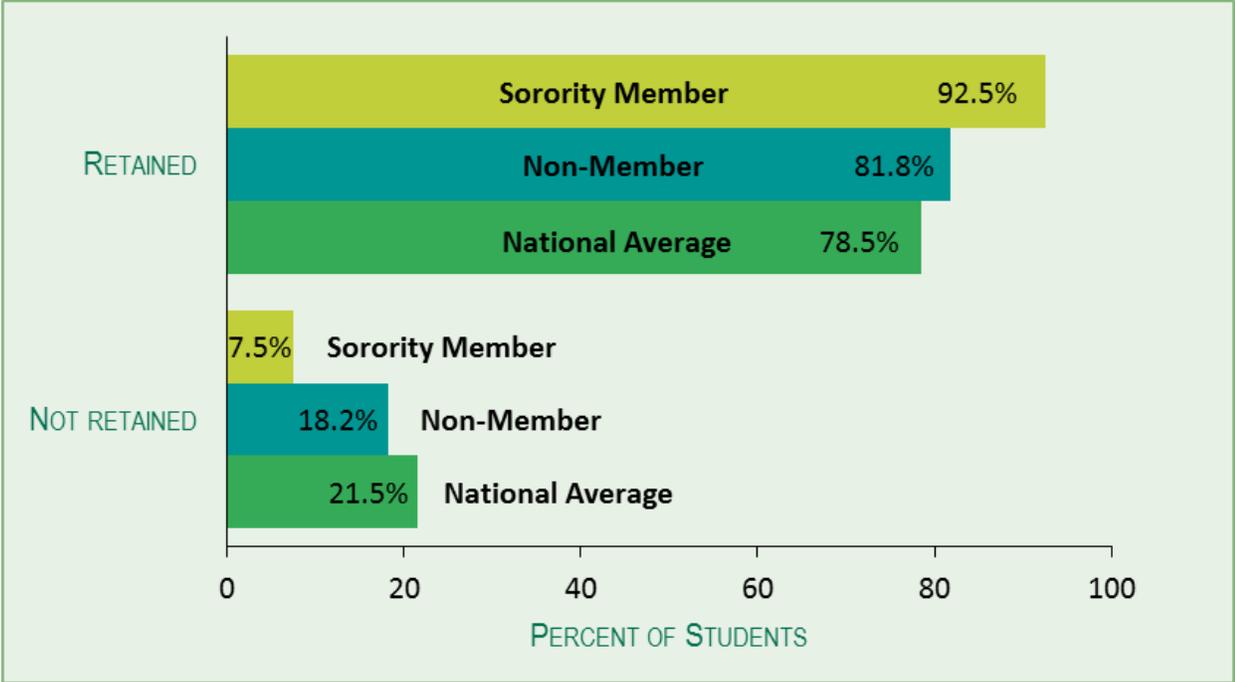


FIGURE 1. COMPARISON OF FIRST-YEAR RETENTION RATE BY MEMBERSHIP STATUS TO THE 2007 NATIONAL AVERAGE

Retention Rate

Predictive Analysis

The five background (Inputs) and three institutional characteristics (Environment 1) were modeled with membership status (Environment 2) to predict retention. The eight additional characteristics were entered prior to membership to control for the influence of those variables. In other words, since women who join sororities tend to have higher high school GPAs and ACT equivalent scores, and rely less on federal grants and loans, entering those variables prior to membership statistically removes their effect on the outcome. Institutional effects were added separately to control for the influence of institution type.

When membership entered at the final step, high school GPA, ACT equivalent, large and medium institution size (versus small and very small), and sorority membership significantly and positively predicted retention, $\chi^2 = 2,518.696$. $df = 11$, $N = 3685$, $p < .001$. Odds Ratios for each variable show the increase each contributes to the probability of retaining. According to this analysis, the likelihood of retaining from freshmen to sophomore year is 3.06 times higher for sorority members as compared to nonmembers.

TABLE 10. PREDICTING FIRST-YEAR RETENTION RATE

INDEPENDENT VARIABLE	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>p</i>
High School GPA	.743	.138	2.103	< .001
ACT Equivalent	.059	.015	1.061	< .001
Federal Grants (Received)	-.212	.136	.809	.120
Federal Loans (Received)	-.065	.115	.937	.574
Out-of-State Status (versus In-State)	-.168	.131	.846	.201
Setting				
Primarily Residential (versus Non)	-.182	.193	.834	.346
Highly Residential (versus Non)	.426	.233	1.530	.068
Size				
Large (versus Small + Very Small)	1.960	.343	7.098	< .001
Medium (versus Small + Very Small)	1.757	.286	5.793	< .001
Control (Private)	-.315	.262	.730	.230
Membership Status (Sorority)	1.119	.114	3.062	< .001
Constant	-2.477	.476	-	< .001

Graduation Rate

Graduation rate was examined using two separate statistical analyses, based on different goals for the outcomes. Chi square analysis was used to examine differences in overall percentages. Logistic regression was used to investigate predictive effects.

Overall

Comparison between NPC members and nonmembers revealed a higher (+13.4%) graduation rate among members. The result was statistically significant $\chi^2(1, N = 4243) = 108.65, p < .001, \phi = .160$, suggesting further sampling within this population would yield a similar difference.

TABLE 11. GRADUATION RATE BY MEMBERSHIP STATUS

WITHIN 6 YEARS	PERCENT OF STUDENTS (# OF STUDENTS)		
	National Average*	Sorority Member	Non-Member
Graduated	59.0	83.9 (1766)	70.5 (1508)
Did not graduate	41.0	16.1 (338)	29.5 (631)
Total # of Students	-	2104	2139

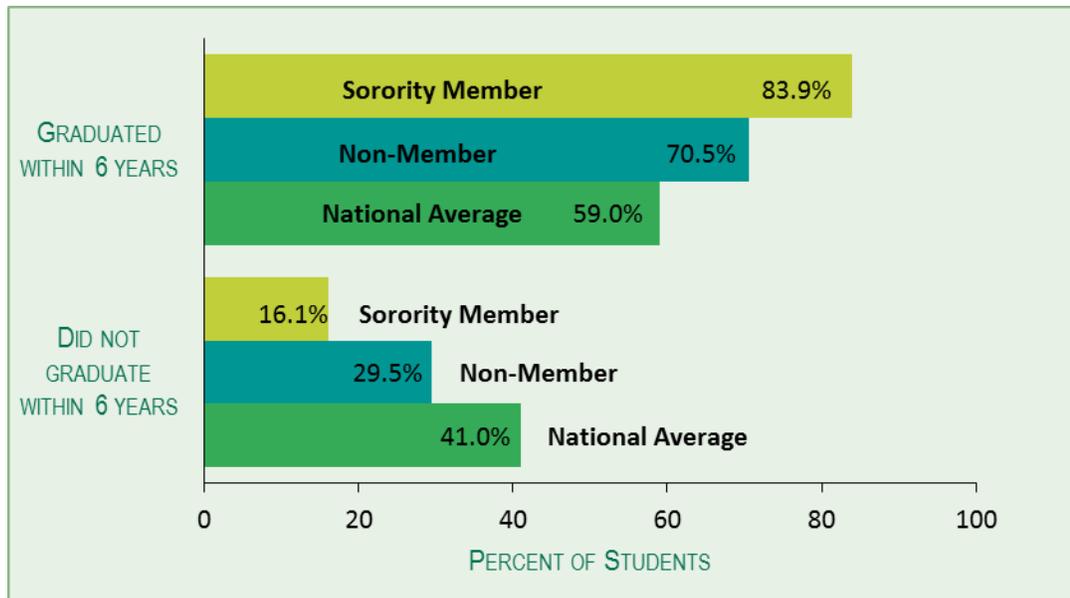


FIGURE 2. COMPARISON OF GRADUATION RATE BY MEMBERSHIP STATUS TO THE NATIONAL AVERAGE

Graduation Rate

Predictive Analysis

The five background (Inputs) and three institutional characteristics (Environment 1) were modeled with membership status (Environment 2) to predict graduation rate. The eight additional characteristics were entered prior to membership to control for the influence of those variables. In other words, since women who join sororities tend to have higher high school GPAs and ACT equivalent scores, and rely less on federal grants and loans, entering those variables prior to membership statistically removes their effect on the outcome. Institutional effects were added separately to control for the influence of institution type.

When membership entered at the final step, high school GPA, ACT equivalent, primarily and highly residential setting (versus nonresidential), large and medium institution size (versus small and very small), and sorority membership significantly and positively predicted graduation rate, $\chi^2 = 3,545.280$, $df = 11$, $N = 3685$, $p < .001$. Odds Ratios for each variable show the increase each contributes to the probability of graduating. According to this analysis, the likelihood of graduating is 2.33 times higher for sorority members as compared to nonmembers.

TABLE 12. PREDICTING GRADUATION RATE

INDEPENDENT VARIABLE	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>p</i>
High School GPA	.982	.116	2.669	< .001
ACT Equivalent	.065	.013	1.067	< .001
Federal Grants (Received)	-.244	.114	.873	.032
Federal Loans (Received)	-.252	.092	.777	.006
Out-of-State Status (versus In-State)	-.175	.105	.839	.095
Setting				
Primarily Residential (versus Non)	.476	.151	1.069	.002
Highly Residential (versus Non)	1.215	.180	3.370	< .001
Size				
Large (versus Small + Very Small)	1.141	.314	3.131	< .001
Medium (versus Small + Very Small)	1.567	.259	4.793	< .001
Control (Private)	-1.217	.229	.296	< .001
Membership Status (Sorority)	.847	.087	2.332	< .001
Constant	-6.009	.528	-	< .001

Time to Graduation

Time to graduation was examined using two separate types of statistical analyses, based on different goals for the outcomes. Chi square analysis was used to examine differences in percentages. Logistic regression was used to test for predictive effects.

Overall

Comparison between NPC members and nonmembers revealed differences in time to graduate among members. Members tended to graduate “on time” within 4 years at a higher (+12.5%) rate than non-members. Rates were comparable for 4-5 (+1.3% for members) and 6-year (+1.5% for nonmembers) graduation. The 6 or less category (+1.3% nonmembers) reflects rates for two institutions not included in the analysis of 4, 5, and 6 due to reporting differences at those institutions. The result was statistically significant $\chi^2(4, N = 4243) = 126.35, p < .001, \phi = .173$, suggesting further sampling within this population would yield a similar difference.

TABLE 13. GRADUATION RATES BY MEMBERSHIP STATUS

YEARS TO GRADUATION	PERCENT OF STUDENTS (# OF STUDENTS)	
	Sorority Member	Non-Member
4	58.4 (1228)	45.9 (981)
5	18.3 (384)	17.0 (363)
6	2.7 (57)	4.2 (89)
6 or less*	4.6 (97)	3.5 (75)
Did not graduate in 6 years	16.1 (338)	29.5 (631)
Total # of Students	2104	2139

*Two institutions provided years to graduation differently

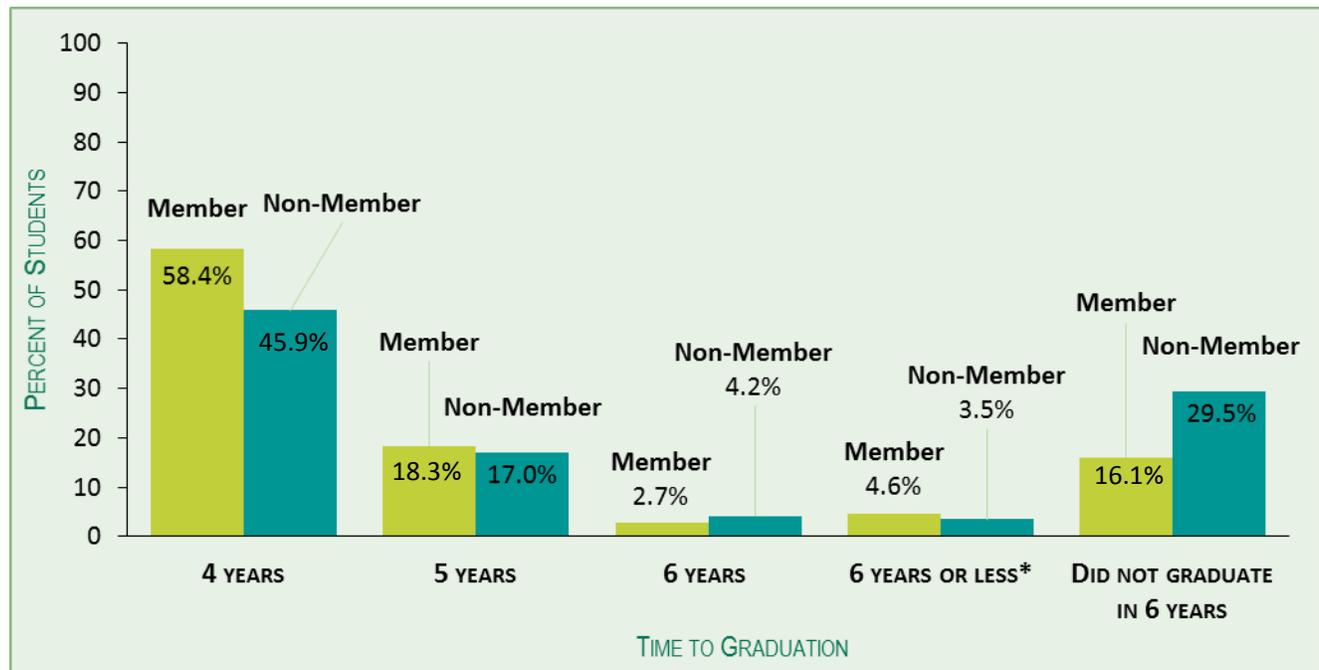


FIGURE 3. COMPARISON OF MEMBERSHIP STATUS AND TIME TO GRADUATION

Time to Graduation

Predictive Analysis

4-year Graduation Rate

The five background (Inputs) and three institutional characteristics (Environment 1) were modeled with membership status (Environment 2) to predict 4-year graduation rate. The eight additional characteristics were entered prior to membership to control for the influence of those variables. In other words, since women who join sororities tend to have higher high school GPAs and ACT equivalent scores, and rely less on federal grants and loans, entering those variables prior to membership statistically removes their effect on the outcome. Institutional effects were added separately to control for the influence of institution type.

When membership entered at the final step, high school GPA, primarily and highly residential setting (versus nonresidential), medium (versus small and very small) institution size, and sorority membership significantly and positively predicted 4-year graduation, $\chi^2 = 4397.33$, $df = 11$, $N = 3685$, $p < .001$. Odds Ratios for each variable show the increase each contributes to the probability of graduating in 4 years. According to this analysis, the likelihood of graduating in 4 years is 1.787 times higher for sorority members as compared to nonmembers.

TABLE 14. PREDICTING 4-YEAR GRADUATION RATE

INDEPENDENT VARIABLE	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>p</i>
High School GPA	1.071	.112	2.918	< .001
ACT Equivalent	.016	.011	1.016	.156
Federal Grants (Received)	-.516	.109	.597	< .001
Federal Loans (Received)	-.330	.083	.719	< .001
Out-of-State Status (versus In-State)	-1.92	.090	.825	.034
Setting				
Primarily Residential (versus Non)	1.125	.183	3.079	< .001
Highly Residential (versus Non)	2.100	.197	8.168	< .001
Size				
Large (versus Small + Very Small)	-.432	.297	.649	.146
Medium (versus Small + Very Small)	.604	.249	1.829	.015
Control (Private)	-1.606	.201	.201	< .001
Membership Status (Sorority)	.580	.074	1.787	< .001
Constant	-5.304	.508	-	< .001

Time to Graduation

5-year Graduation Rate

The five background (Inputs) and three institutional characteristics (Environment 1) were modeled with membership status (Environment 2) to predict 6-year graduation rate. The eight additional characteristics were entered prior to membership to control for the influence of those variables. In other words, since women who join sororities tend to have higher high school GPAs and ACT equivalent scores, and rely less on federal grants and loans, entering those variables prior to membership statistically removes their effect on the outcome. Institutional effects were added separately to control for the influence of institution type.

When membership entered at the final step, high school GPA, ACT equivalent, large and medium (versus small and very small) institution size, and sorority membership significantly and positively predicted 5-year graduation, $\chi^2 = 2135.655$, $df = 11$, $N = 1732$, $p < .001$. Odds Ratios for each variable show the increase each contributes to the probability of graduating in 5 years. According to this analysis, the likelihood of graduating in 5 years is 1.993 times higher for sorority members as compared to nonmembers.

TABLE 15. PREDICTING 5-YEAR GRADUATION RATE

INDEPENDENT VARIABLE	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>p</i>
High School GPA	.575	.148	1.777	< .001
ACT Equivalent	.055	.016	1.056	< .001
Federal Grants (Received)	-.144	.140	.866	.304
Federal Loans (Received)	-.082	.116	.921	.479
Out-of-State Status (versus In-State)	.031	.142	1.031	.829
Setting				
Primarily Residential (versus Non)	.239	.175	1.270	.172
Highly Residential (versus Non)	.281	.223	1.324	.208
Size				
Large (versus Small + Very Small)	2.304	.585	10.018	< .001
Medium (versus Small + Very Small)	1.525	.512	4.597	.003
Control (Private)	-.317	.355	.729	.372
Membership Status (Sorority)	.690	.107	1.993	< .001
Constant	-6.391	.786	-	< .001

Time to Graduation

6-year Graduation Rate

The five background (Inputs) and three institutional characteristics (Environment 1) were modeled with membership status (Environment 2) to predict 6-year graduation rate. The eight additional characteristics were entered prior to membership to control for the influence of those variables. In other words, since women who join sororities tend to have higher high school GPAs and ACT equivalent scores, and rely less on federal grants and loans, entering those variables prior to membership statistically removes their effect on the outcome. Institutional effects were added separately to control for the influence of institution type.

When membership entered at the final step, no variables significantly predicted 6-year graduation, $\chi^2 = 729.584$, $df = 11$, $N = 1033$, $p < .001$. According to this analysis, the likelihood of graduating in 6 years is not influenced by sorority membership.

TABLE 16. PREDICTING 6-YEAR GRADUATION RATE

INDEPENDENT VARIABLE	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>p</i>
High School GPA	.451	.265	1.570	.089
ACT Equivalent	.062	.029	1.064	.035
Federal Grants (Received)	.353	.240	1.423	.141
Federal Loans (Received)	-.153	.211	.858	.468
Out-of-State Status (versus In-State)	-.575	.274	.563	.036
Setting				
Primarily Residential (versus Non)	-.562	.183	.570	.062
Highly Residential (versus Non)	-.634	.197	.530	.120
Size				
Large (versus Small + Very Small)	-	-	-	.997
Medium (versus Small + Very Small)	-	-	-	.997
Control (Private)	.861	.532	2.365	.106
Membership Status (Sorority)	.200	.202	1.222	.321
Constant	-24.620	5132.671	-	.996

Final College GPA

Comparison between NPC members and nonmembers revealed no statistical difference in final college GPA, $F(3100) = .416, p = .519$.

TABLE 17. COMPARISON OF FINAL GPA AND MEMBERSHIP STATUS

FINAL COLLEGE GPA	Sorority Member (1669)	Non-Member (1433)
Mean	3.30	3.29
Standard Deviation	0.43	0.38

Appendix

Methodology

This study primarily utilized a descriptive design. Descriptive designs are desirable when the goals of the study are to demonstrate relationships and describe observable phenomenon, as they exist. The design also included predictive analyses to control for pre-college background and institutional characteristics associated with outcomes. Data were collected during one period; however, the study is considered longitudinal because the existing records examined encompass a six-year span.

Research Questions

1. How is joining an NPC sorority associated with retention rate, as compared to nonmembers?
2. How is NPC sorority membership associated with six-year graduation rate, as compared to nonmembers?
3. How is NPC sorority membership associated with time to degree, as compared to nonmembers?
4. How is NPC sorority membership associated with a final college GPA, as compared to nonmembers?

Data

A dataset was created for this study using existing quantitative records. Variables comprising the dataset were obtained from student records at 18 four-year postsecondary institutions. Data collection took place from April to September of 2014. Membership in an NPC sorority was the primary grouping variable and NPC member groups were considered the population. Data collection involved sequencing between NPC, individual NPC member groups, and institutions to obtain a sample of members and randomly selected non-members for comparison. Participating groups or institutions are not identified in this study. A description of the data collection procedure follows.

NPC provided a list of postsecondary institutions hosting member groups (N = 658). Carnegie Basic designations were added to this listing and a random sample, stratified by Size and Setting, was generated using a random number table. A sample of 146 institutions was selected for the study. Representatives from institutional research (or equivalent) offices at each institution were contacted and asked to participate in the study. The institutional review board (IRB) at the researcher's host institution exempted the study; however, most institutional representatives also routed the request through IRB personnel for consideration and/or approval prior to agreeing to participate. The sequence of obtaining data is outlined below.

1. After institutional representatives agreed to participate, lists of participating institutions were sent to NPC who requested 2007 initiation records from member groups. These lists were provided to the researcher, who collated first, last, and middle (if available) names and sent the lists to institutional representatives.
2. Institutional representatives matched the names on the NPC member lists with institutional records for the variables requested and generated a matched random sample of nonmember women who also attended in 2007. For example, if 100 names member names were provided, institutional representatives matched as many of those as possible and then doubled the sample by adding nonmember women. Institutional representatives replaced names on the records with case numbers and added a variable to indicate membership status to the final data file.
3. After receiving institutional data files, the researcher merged all data into a master database and inspected records for completeness. Questions or issues relating to specific institutional data were resolved prior to analyses.
4. Five rounds of data collection were completed. The final two rounds also were randomly selected, but were oversampled based on institutional size (low numbers for very small and small) and member group representation (low numbers for some groups).

To address potential non-response bias, several first round institutional representatives who initially did not respond were re-contacted and two agreed to provide data during the last round of the study. Analysis showed acceptable homogeneity across the primary variables of interest variables for the non-response institutions and the full dataset. Additionally, a control institution was added as an initial proxy to develop variable categories and refine coding. This institution was also added to the final sample, after analysis confirmed similarities with final study variables.

Variables

Variables used in this study included one grouping attribute, four educational outcomes, five pre-college background controls from student records, and three institutional controls from Carnegie Classification listings. A list of study variables appears below, followed by a description of how each were derived, defined, and/or modified in this study:

Sorority Membership (Grouping Attribute)

- Membership in an NPC sorority

Educational Outcomes (Dependent Variables)

- Retention to Sophomore Year
- Graduation Rate
- Time to Graduation
- Final College

Student Records (Background Characteristics)

- High school GPA
- Composite SAT or ACT
- Federal grants received
- Federal loans received
- In-state/out-of-state/international status

Carnegie Classification (Institutional Characteristics)

- Size
- Setting
- Control

Several other data points were also requested from institutional representatives, but were not available consistently across institutions for inclusion in the study. These included first generation status (i.e., whether or not a parent holds a four-year degree), parent education (i.e., highest degree earned of father/mother/guardian), parent income (annual income), intercollegiate athletic participation, and other extracurricular involvement.

Sorority Membership (Grouping Attribute)

The grouping attribute used in this study was membership in an NPC sorority. This classification had to be provided by NPC member groups, since few institutions track sorority membership and fewer still (if any) differentiate membership by council (e.g., NPC) in institutional databases. In some cases not all names provided by NPC member groups could be matched due to insufficient information such as the lack of a middle initial or other identifier (e.g., there could be four Rebecca Smiths in a cohort). In these few cases, ambiguous names were dropped, resulting in a negligible loss of data.

Educational Outcomes (Dependent Variables)

Four educational outcomes served as dependent variables. Retention is defined as freshman to sophomore year. Graduation rate is defined as graduating *within* six years. Time to graduation was coded differently by some institutions, ranging from a continuous value (years to graduation) to a within four, five, or six year value. For this study, all values were standardized to *in* four, *in* five, or *in* six and analyzed as binary outcomes in separate databases to prevent value inflation. Two institutions only provided a “within six years” rate, which was analyzed separately when appropriate. Three cases were deleted for students who graduated in more than six years. College GPA was only analyzed for students who graduated since the variable was not normally distributed given the disproportionate number of 0.0 to 1.0 scores among non-graduates. Values for retention and graduation were complete for all cases; however, 318 cases were missing final GPA.

Student Records (Background Characteristics)

Variables based on student records that were not provided or not scaled in such a way that they could be standardized or converted to an equivalent were omitted. High school GPA was requested based on core academic subjects, though a few institutions provided full GPA. These were treated similarly in the dataset, as they were equally scaled, but should be interpreted with caution since non-core GPA is generally higher. Composite SAT or ACT scores were converted to ACT equivalent using a College Board Concordance Table. Federal grants and federal loans received were consistent across 16 institutions; however, 2 classified Perkins loans as grants. Significance testing revealed no differences between the divergent categories, so records for all 18 institutions were utilized. Both financial aid variables were based on status as of 2007. In-state/out-of-state/international status was recoded as binary (in-state versus out of-state – inclusive of international students).

Each of the background characteristics was used as a control in predictive analyses. High school GPA and ACT equivalent were modeled based on the hypothesis that women who join sororities tend to have higher academic records on college entry than nonmembers students. Federal aid and loans received freshmen year was used as a proxy for socio-economic status (SES), based on the hypothesis that members tend to come from higher SES backgrounds. In-state/out-of-state/international status also was used as an SES proxy, as out-of-state residents tend to pay higher tuition rates at public institutions. Parent income would have been a more precise metric, but those measures were not consistently available.

Most institutional representatives provided records for only first-time, full time women; however, it is likely that many women who did not meet this criterion were included in the study. At one institution included in the study, for example, women only joined sororities during their sophomore year. This inconsistency was not considered problematic, given that few women nationally join beyond the first year and considering that few participants in this study graduated in less than four years.

Carnegie Classification (Institutional Characteristics)

Institutional characteristics were derived from the 2010 Carnegie Classifications. Size, setting, and control for four-year institutions were chosen based on previous research linking these attributes to differences in educational outcomes. To enhance the representativeness of the sample, stratification was based on size and setting combinations (e.g., very small, primarily nonresidential). The four size categories are defined as follows: very small = less than 1,000 students, small = 1,000-2,999 students, medium = 3,000-9,999 students, and large = more than 10,000 students. The three setting categories are defined as follows: primarily nonresidential = fewer than 25% of students live on campus, primarily residential = 25-49% of students live on campus, highly residential = more than 50% of students live on campus. Control refers to public and private.

Sample

A total of 18 institutions participated in the study. Representatives from three additional campuses agreed to participate, but were unable to meet the study deadline. The final sample of institutions approximates the population of four-year institutions hosting NPC member sororities in terms of size, setting, and control. Compared to national averages for educational outcomes, the sample rates were higher for first year retention and graduation rates; however, this was expected given the focus on sorority members and women in the sample.

The final dataset consists of 4,243 total cases (2,104 members, 2,139 nonmembers). The number of students from each institution varied significantly; however, no attempt at comparing students by institutions was intended. Students from large institutions are over-represented in the dataset; however, comparisons for outcomes based on size, setting, and control were either non-significant or nearly similar across all institutional types. An exception was higher retention and higher “within 4 year” graduation rates among students at higher residential and very small institutions, an expected finding based on previous research for these institutional characteristics. Because of low cell counts, the small and very small size categories were combined for predictive analyses.

NPC members are defined as women who were initiated (i.e., joined) in 2007. A total of 86 NPC chapters are represented in the study from 24 of the 26 NPC member organizations. The median number of chapters represented per group was 4. While the majority of members maintained their association through graduation, women who chose to no longer affiliate were also classified as members if they were initiated in 2007. Inconsistencies between member group and institutional records were inadequate to determine the class levels of the women, though the majority was first or second term freshmen, according to records that could be confirmed. Not all NPC members on each campus were included in the sample. Most of these cases resulted from the inability of an NPC member group to provide member names.

Data Analyses

Most data examined in this study were nominal and examined with cross tabulations. Significant differences were tested using a nonparametric statistic (chi square analyses) with Phi reported for effect size. Because retention, six-year graduation rate, and time to degree (separated by four, five, and six year rates) were nominal variables, binary logistic regression was used for predictive analyses of these outcomes. All predictors met the assumptions for analyses and correlation tests revealed no problems with multicollinearity. This also suggested interaction effects may not impact the overall model; however, interaction terms based on hypotheses informed by previous research were built into preliminary models (e.g., sorority membership x small institution x highly residential). None were found to contribute significantly to final equations. All assumptions, including normal distribution on continuous predictors were met or found to be within acceptable levels. All statistical analyses were set to $\alpha = .01$ to control for Type I error.

Limitations

Several limitations of this study are acknowledged. With regard to the sample, the 18 institutions included in the final dataset should not be considered unconditionally representative of all four-year colleges and universities hosting NPC organizations; however, the sample approximated the population in terms of institutional size, setting, and control as well as system size. In addition, not all members were first-time, full-time students, although the data provided by institutions were filtered for this variable in many cases. As result, this study is more appropriately considered to be approximately representative of women who joined in 2007. Further, measurement invariance, or a mismatch between comparison groups based on sample selection (Chen, 2008) is a potential limitation in this study. To account for this issue, the sample was stratified to be representative of institutional size and setting and a sufficient number of institutions within each of these categories was included in the final sample. Future studies would benefit from using propensity score matching to generate samples; however, only one of the institutions in this study had the capability of doing so.

With regard to representativeness to the member population, 24 of 26 groups provided data, which was reasonably evenly distributed across the dataset with a few outliers. Because data were returned without identifiers, it was not possible to test within-group differences. The large sample size and differentiation between groups on campuses (e.g., a sorority may have the highest GPA on one campus, but the same group may be lowest on another) aided in ensuring the more general conception of “NPC member” is valid.

Women who join sororities do not tend to exhibit the same risk factors for educational success, such as low SES and modest academic ability. While background characteristics were added to control for some influences, other factors such as parent education could not be accounted with the available data. Finally, as with any research, a major consideration is endogeneity, or the infinite number of unobservable variables that could affect a study. Additional sorority-specific measures such as engagement (e.g., hours of involvement per week), leadership positions held, membership in outside organization, and chapter-specific variables such as chapter size, peer effects, and organization culture can influence outcomes associated with membership (e.g., Biddix et al., 2014). Unfortunately, the lack of commonly accepted practices for research on sorority and fraternity members, coupled with the lack of datasets inclusive of this population, makes overcoming these limitations difficult.

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