Predictors of Suspension and Failure in Greek Organizations in a Large Southeastern Public University

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Abstract

Greek organizations first started with the purpose of brotherhood and friendship, but in recent times reports of hazing, alcohol, sexual assault have been linked to these university organizations. At North Carolina State University, some have been sanctioned for violating the Code of Student Conduct and been suspended or rendered inactive. Active greek organizations are desireable to a university, and predicting a future inactive chapter can allow resources to be better allocated to these organizations to prevent failure. Logistic regression was used to build a model to predict active status (a binary response) utilizing several published covariates from the university's Standards Program report. Only one covariate (the total compliance score) was a significant ($p < 0.05$) parameter in the predictive model, with an APER of 17%. This model suggested that low compliance scores are associated with inactive chapters, and this knowledge can be used by the university to predict greek organizations that are likely to fail so addition support or training can be offered.

Keywords: Logistic Regression; Binary Classification; Greek Organizations Failure

Introduction

The establishment of the Phi Beta Kappa fraternity in 1776 initiated a tradition that has for many university students in American become an integral part of college life: membership in a Greek organization (Wikipedia). While Phi Beta Kappa is a predominantly academic fraternity, social fraternities and sororities began appearing on college campuses as early as 1825, when the Kappa Alpha Society was established. The stated purpose of these organizations was originally brotherhood and friendship, and over time other themes such as service, philanthropy, scholarship, leadership, and social responsibility also became part of their mission. These foci still apply to modern Greek organizations, and current research suggests that membership in Greek life does help students to grow in these areas (Barnhardt Cassie L., 2014; Hevel Michael S., Martin Georgianna L., & Pascarella Ernest T., 2014; Martin, Hevel, Asel, & Pascarella, 2011; Martin, Hevel, & Pascarella, 2012; Long, 2012; Routon & Walker, 2014). Additionally, membership provides valuable networking opportunities with alumni, which can lead to employment post-graduation (McClain, 2017).

Despite evidence of the benefits of Greek life memberships, recent decades have witnessed a shift in public perceptions of Greek life on college campuses as an increasing number of reports of hazing, alcohol and other substance use, and sexual assault have been linked to social fraternities (and some, though fewer, sororities), especially those that are majority white male (Franklin, Bouffard, & Pratt, 2012; Phua, 2011; Ragsdale et al., 2012). Recent studies have confirmed that these problems often co-occur and mediate one another. For example, Kingree & Thompson (2013) linked high risk alcohol use to sexual aggression in a longitudinal study of over 400 male students.

North Carolina State University (NCSU) is not immune to these problematic behaviors within fraternities. As of January 4th, 2017, three Greek organizations – Sigma Alpha Epsilon, Sigma Chi, and Theta Chi - had been revoked and one – Zeta Psi - permanently suspended from the campus, mainly for substance use violations. Additionally, three fraternities and one sorority have been sanctioned for violating NCSU's Code of Student Conduct. The prevalence of infractions within Greek life at NCSU indicates that actions should be taken to determine what factors might predict revocation of Greek charters or suspension from the university.

In 2004, leaders in the Greek life community collaborated with staff from the university's Department of Fraternity and Sorority Life to create a Standards Program that mapped out organizational expectations for 10 shared principle within the Greek community: Alumni/Chapter Relations, Campus Leadership & Involvement, Council Involvement, Educational Programming, Finances, Leadership Training, Membership, Risk Management, Scholarship/Academics, and Service/Philanthropy. Annual reports that score organizations on their success in these areas seek to create accountability within Greek life. Our proposed study is exploratory and seeks to determine whether compliance scores on the Standards Program report is significantly related to the likelihood of an organization's suspension or failure over the 12 years since the program's establishment. Further, because this study is exploratory it will test the number of members, average GPA, council membership, and organization gender as covariates.

Methodology

Data were collected from Grade and Membership Reports of the North Carolina State University Fraternity and Sorority Life Department, and it is publicly available on the website (https://fsl.dasa.ncsu.edu/about-our-community/reports/). For each of the 66 Fraternity and Sorority organizations, the following scores were reported for each year between 2005 and 2016

(for years when an organization was ‘inactive’ no data was collected): Status (Active/Inactive); Organization Gender (Fraternity/Sorority); Council Recognized by (4 councils: PA, IFC, NPHC, MGC); Compliance scores for 10 organizational expectations (2=met; 1=conditional; 0=not met); Number of Members (Continuous Variable); and Grade Point Average (GPA, Continuous Variable). The two groups for discrimination and classification are a) organizations that were never inactive (n=42) and b) organizations that were inactive at one point in the 11-year span (n=15). Inactive Greek organizations are also referred to as failures, and the two will be used interchangeably in this report.

The objective of the logistic regression analysis was to determine which covariates could predict the active/inactive status of an organization. Logistic regression will be used to form classifications that predict likelihood of expulsion (or suspension) for Greek organizations utilizing compliance scores, GPAs, member size, and other organization classifications. The ten compliance scores will be summed together as a one ‘total compliance’ value. Numerical covariates (total compliance, member number, and GPA) were averaged over the 11 years of data. The categorical covariates (gender and council) did not change with time, and thus were not to be averaged. Organizations that were not in existence for at least 3 years prior to reaching inactive status were excluded from analysis because not sufficient data was able to be collected (n=9). This type of discriminant analysis was chosen because data are not expected to follow a normal distribution (instead it is binary). The regression will predict the inactive status G=0 “never” vs. G=1 “at one point” using the collected data (averaged continuous variables and classification variables discussed above).

The GLM function in R was used to model the data because the population average was of interest, not individual organizations (fixed effects). The logistic exponential family for the

active status (either active/inactive) was specified by the code (family=binomial(link='logit')). Each of the covariates, as well as interactions between covariates, was evaluated within the model. Initially, significance of the beta parameters was assessed using the standard error and z-values, but the deviance and corresponding Chi Square tests were also utilized. Further, an apparent error rate (APER) was calculated using the final model to measure the quality of the model. It is expected that these accuracy values are biased because the tested data were used to fit the original model, but due to the small data set, it was decided not to reduce the number of samples any further by saving a 'testing' set.

Results

Data were first plotted for outliers. For any outliers, the dataset was checked for accuracy and the issues were resolved (correcting typos). Correlations between variables were also assessed, and tended to be negligible to moderate. The final logistic regression model (using a significance level of $p < 0.05$) was:

$$\log(Pi/(Pi-1)) = \beta 0 + \beta 1 * \text{Total Compliance Score} \quad [\text{Eq. 1}]$$

Where Pi = probability of "never inactive" ; $\beta 0 = 12.3$; $\beta 1 = -1.04$

Other covariates (gender, member number, GPA, council) and each interaction between the covariates were tested through multiple models, but none were significant ($p<0.05$) (Table 1). Based on the model, organizations with lower average GPA or member numbers are not necessarily at risk for becoming inactive, as one might expect. Instead, the compliance scores of the organizations were the best indicator of a group that is at risk for becoming inactive. Table 2 provides classification/misclassification information in the form of a confusion matrix, based upon the model using total compliance score as the only independent variable (Eq. 1). The apparent error rate (APER) was calculated for this model to be 17% (10/57). To test the model,

scores from Greek organizations from a different university may have provided a more accurate representation of the accuracy of the model, but was not available for this analysis. From the confusion matrix, it appears that one source of chapters becoming inactive was addressed in the model (with low compliance scores) but this covariate could not predict the inactivity of all the inactive organizations. Of the 15 "once inactive" organizations, only 6 were correctly predicted by the model (Eq. 1). Thus, the other 9 Greek organizations likely became inactive for reasons not accounted in the variables we obtained (such as suspension for behavior). It is hypothesized that this model predicts organizations that go inactive due to lack of involvement for the members, but does not capture organizations that are suspended or expelled for behavior reasons. For an improved model, covariates that can capture alcohol citations or other predictors relating to suspensions/expulsions should be assessed.

Discussion

In testing multiple models, only the total compliant score was found to be significantly associated with the failure rates of Greek organizations, at the $< .05$ level. These results contradict our expectations that other factors in Greek life, such as organization gender, would be significant as well. Little research has currently been conducted into correlates and predictors of failure rates in Greek organizations, though a plethora of research has found organization gender differences in alcohol and other substance use, which we would have expected to be reflected in the Greek organization failure rate. It could be that the substance use differences were captured in the "risk management" dimension of the total compliance scores, rendering the gender factor nonsignificant. In order to get a better fitting model, we could have carried out a stepwise logistic regression, but again this may yield biased results since the data remains same for each iteration and the model is likely to be overly simplistic, thereby missing out on details specific to the data

that we have. Additionally, if two predictor variables are highly correlated, only one might end up in the model even though either may be important.

There are two major limitations in our study. The first is that the data were aggregated to perform a cross-sectional analysis. This was necessary as the data were too imbalanced to treat longitudinally, but could have oversimplified our model, influencing the final model. The second limitation is that we were unable to conduct a holdout cross-validation because the data were too limited, which could have biased our calculated APER. However, considering how unbalanced the data are, fitting any model was a challenge, and GLM was able to provide an exploratory perspective of the correlates to failure in Greek organizations.

Table 1

Models fit to data, quality of fit, and significant variables

Model	AIC	Significance
Failure ~ Council + member.count + member.count * totalcomp + totalcomp	52.118	Total Compliance
Failure ~ member.count * Council + totalcomp	54.215	Total Compliance
Failure ~ Council*totalcomp + member.count*Council + Council*totalcomp + Council*GPA + Council	55.151	Total Compliance Council*Number of Members
Failure ~ totalcomp + GPA + gender + member.count + Council	55.933	Total Compliance
Failure ~ member.count * Council + totalcomp	54.215	Total Compliance
Failure ~ member.count * totalcomp + member.count * Council + Council * member.count + member.count * GPA + member.count	59.525	Total Compliance
Failure ~ totalcomp + Council + Council * totalcomp +totalcomp * gender + GPA + gender + member.count	62.334	ns

Table 2

Confusion Matrix for failures based on total compliance scores

		Classified As	
		Never Inactive	Failed
True	Never Inactive	41	1
	Failed	9	6

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