Long-term Effects of Greek Affiliation on Alcohol Consumption

Kennedi Fichtel

University of Florida
ABSTRACT

Study: There is an established body of literature concerning the utility of Akers’ Social Learning Theory as an explanation of deviant behavior, including excessive alcohol use by college students, specifically those who were involved in sororities and fraternities. A competing theory to social learning theory would be a biological explanation of excessive drinking that would purpose biological predispositions for excessive use of alcohol by some, and not others. Additionally, a bio-social explanation would hypothesize that while social learning theory can explain the learned onset of excessive drinking through interactions in social situations that reinforce heavy alcohol use (Greek life participation), a biological change takes place that is independent of the initial learning process. This biological change explains the excessive drinking after the interactions and reinforcements of Greek life participation are no longer present. This study proposes to test the “competing” explanations of excessive drinking by looking at the drinking patterns of college students after graduation to determine if after the separation from Greek life participation drinking increases, decreases, or stays the same. It is expected that all drinking will decrease, but if a significant difference between those who were involved in Greek organizations and those who were not still remains after graduation, it could be an indication of support for a biological explanation. If the difference in drinking between those who participated in a Greek organization and those who did not is not significant, it could be an indication of support for a social leaning explanation.

Method: The data utilized in this research came from a self-report survey of undergraduate alumni of a major university in the southeast. The anonymous survey was administered through alumni Facebook pages using Qualtrics. The sample was a sample of convenience. The alumni groups ranged from localized groups for graduates in a certain city, to nationwide groups with upwards of 1500 online members, with the smallest number of members averaging around 60. The total number of respondents was 219, but because of responses that included empty fields, responses that had typing errors, outlier data, and non-uniform responses, the total valid sample size was reduced to 115.

Results: The univariate analysis showed a difference between alcohol consumption levels during college among Greeks and non-Greeks, but this was not shown following graduation. The regression analysis showed the statistically significant variables that impacted drinking during college included age at first alcohol consumption, sex, and year born. The statistically significant variable that impacted drinking levels following graduation was sex.
INTRODUCTION

There is an established body of literature that supports a relationship between Greek life participation and increased alcohol use. Alcohol consumption is consistently higher in traditional fraternities and sororities than in non-Greek society (Cashin, Presley, and Meilman, 1998). As stated in Cashin et al. (1998) (cited from Presley, Meilman, and Lyerla, 1993) Greek house residents drink more, drink heavily more often, and experience more negative consequences from drinking than the general student population by significant margins.

There is a hole in the literature, though, regarding the status of those increased alcohol consumption levels among Greek students post-graduation (Wechsler, H., Kuh, G. D., & Davenport, A. E., 1996). Literature has not examined the long-term effects of Greeks drinking more than their non-Greek equivalents, and whether or not the significant differences persist after graduation. This research will begin by examining the existing literature showing the differences between Greek and non-Greek populations regarding alcohol consumption, cognitive differences, and health behaviors. Two theoretical perspectives will guide the research: Social Learning Theory and Biosocial models. Social Learning Theory will be used to examine the possibility that Greeks will drink more than non-Greeks during college, but that drinking following college is similar. Biosocial model would predict that Greeks will continue to drink more than non-Greeks following graduation.
PREVIOUS LITERATURE

The literature is first reviewed for behavioral norms in Greek life; here the differences among Greek and non-Greek populations will be examined. Next, Social Learning theory is discussed as a possible explanation for the drinking behavior among college students. Biosocial model is offered as an explanation for the increased drinking during college, as well as following college. Literature will then be reviewed on how a sustained environment can alter the structure and function of the brain; substance use and its effects on the adolescent brain could explain possible increases in substance use later in life. These theories mentioned would explain why drinking levels exhibited during college could possibly persist following graduation.

Greek life Behavioral Norms

Greek life has been associated with higher levels of alcohol consumption, poor health maintenance, and changes in cognition, “increasing levels of involvement with fraternity life corresponded with increasing use of alcohol” (Cashin et al., 1998, p. 65). Those uninvolved in Greek life drink significantly less than those at any level of involvement in Greek life (Cashin et al., 1998). To further the support for the idea that Greek life increases alcohol consumption, Juhnke, Schroat, Cashwell, and Gmaltza (2003) demonstrate in their study of universities with limited existence of Greek organizations that there was less incidents of binge-drinking, alcohol-related issues, and alcohol consumption as a whole. Further support that Greek organizations and their norms lead to increases in drinking, it has been shown in a study done by Capece and Knowles, (2015, p. 14):

Only 19% of non-Greek freshman reported that their drinking had increased in the prior 12 months, with approximately 60.8% saying that it had decreased or that they had not used alcohol. In contrast, over half (56.4%) of the college freshmen that were associated
with Greek organizations reported that their intake of alcohol had increased over the same 12 month period.

This difference in alcohol consumption among Greeks and non-Greeks has been used to assert the existence of a culture to Greek life. Scott-Sheldon, Carey, and Carey (2008) demonstrate in their study of Greek life that Greeks drink at higher levels than non-Greeks; they go on to include the fact that Greek students surpass non-Greek students in heavy episodic drinking, average number of drinks, and frequency of alcohol consumption. These behavioral norms bleed into other parts of life as well, including maintenance of health.

Health Behavior Differences

Beyond drinking, Scott-Sheldon et al. (2008) found that Greek students smoke cigarettes more often than non-Greek students, Greek students use more drugs than their non-Greek counterparts, and Greek members have more sexual partners. In addition to higher numbers of sexual partners, Greek members had more sex under the influence of alcohol, and had less confidence that their friends would approve of condom use (Scott-Sheldon et al., 2008). Sorority women under the legal drinking age who lived in their sorority house were more likely than non-sorority women to utilize a fake ID to obtain alcohol (Wechsler et al., 1996). In addition to obtaining alcohol illegally, residents of Greek houses have been found to drink and drive or to ride with an inebriated driver more often than non-Greek affiliated students (Wechsler, Kuh, Davenport, 1996).

Cognitive Changes due to Greek Life

Changes in cognition as a result of Greek organization-involvement have been examined. One study referenced by Pascarella, Flowers, and Whitt (2001) (cited from Pike and Askew,
1990) looked into students’ competence levels in intellectual and analytical skills, communication, reasoning, and problem solving. The results of Pike and Askew (1990) showed that Greek students’ COMP (College Outcomes Measures Project Objective Test) scores were significantly lower than non-Greek students. Pascarella et al. (2001) designed a study to measure Greek life impact on 5 different cognitive factors: writing skills, science reasoning, gains in understanding arts and humanities, gains in understanding science, and gains in writing and thinking skills. The results of this study showed negative impacts on all 5 cognitions for men in Greek life, though the data analysis showed the magnitude of the effects to be non-statistically significant in each of the cognitions besides reading comprehension and understanding arts and humanities (Pascarella et al., 2001). Women in sororities had non-statistically significant negative impacts on their writing skills and science reasoning (Pascarella et al., 2001).

**Social Learning Theory**

Social Learning Theory is a possible explanation for a supposed culture within Greek life defining the drinking norms, and leading to a change in alcohol consumption during college. Akers’ Social Learning Theory (Akers, 1985,1998) is based upon 4 major concepts: differential association, definitions, differential reinforcement, and imitation. Differential association outlines the associations that lead to creations of definitions, as well as models for imitation, and persons and environment for differential reinforcement. According to Akers et al. (1979), the four most important associations are those that occur earlier (priority), last longer and occupy more of one’s time (duration), take place most often (frequency), and involve others with whom one has the more important or closer relationship (intensity); these have the greatest effect on behavior.
Next, Social Learning Theory states that definitions are the attitudes and beliefs that one attaches to behavior labeling the behavior as good or bad (Akers, 1985, 1998). According to Akers et al. (1979), the more an individual defines a behavior as positive, or attaches a neutralizing definition to it, the more likely he or she is to engage in it; the more negative definitions are attached to a behavior, the less likely he or she is to engage. These definitions can then be reinforced, utilizing either nonsocial (physiological drug reaction for example) or social reinforcements (the groups that expose an individual most to behavioral modeling and reinforcement/punishment for certain behaviors). According to Akers, et al. (1979), differential association comes first in the sequence, leading to an avenue for exposure to definitions and imitation of modeled behaviors, which then creates a social reinforcement (or punishment) for certain behaviors exhibited.

Support for Social Learning Theory

Support for Social Learning Theory is extensive (Pratt, Cullen, Sellers, Winfree, Madenson, Daigle, Fearn, and Gau, 2010). Deviant behavior, such as smoking, has been explained by Social Learning Theory (Akers and Lee, 1996; Lanza-Kaduce and Capece, 2003); also, the theory has been supported in research regarding marital violence and its reoccurrence (Mihalic and Elliott, 1997). Given its empirical validity, this theory could be used to explain the drinking behavior among Greek students. If Social Learning Theory is used to explain drinking in Greek life, what happens when the influence of Greek life is removed? This is the hole in the literature to be examined. If drinking levels in graduates of Greek organizations are persistently higher than non-Greek graduates, some other explanation than Social Learning Theory would account for that.
Biosocial Model

Biosocial models can be used to possibly explain the increased drinking in Greeks during college, and the maintained drinking levels following college. Those who were heavily exposed to alcohol consumption in adolescence could have experienced biological change from the pressures to participate in such behavior (Buikhuisen, 1988). In such a case, adoption studies, like the one done by Mednick (1977) shows there is the highest amount of criminality among adopted sons who’s biological and adoptive fathers had criminal backgrounds, suggesting that the conjunction of learned behavior and a biological component is the strongest predictor of expressed behavior. The lowest amount of criminality was among those sons whose adoptive and biological fathers had no criminal backgrounds (Mednick, 1977). “Specifically, greater involvement in the Greek system (compared with lesser or no involvement) was associated with greater alcohol use and problems prior to college and with significant increases in drinking over the first 2 years of college” (Capone, Wood, Borsar, and Laird, 2007, p. 10).

Culture as a Sustained Environment

Greek life may be able to maintain behavioral norms regarding alcohol consumption, health behavior, and cognitions due to its cultural nature. Traditional Greek organizations function as a culture: with values, norms, and even language. Stated by Whipple and Sullivan (1998, p.10), “Greek letter organizations constitute a powerful student culture, with powerful implications for their members’ learning.” According to Barkan (2011), a culture is made up of symbols, language, norms, values, and artifacts. In order to parallel Greek life to traditional
cultures, each component of Barkan’s (2011) culture is discussed as it is demonstrated by Greek affiliations.

As stated by Whipple and Sullivan (1998, p.7), “Phi Beta Kappa established precedents that today’s groups still follow, including names composed of Greek letters; secret rituals and symbols that affirm shared values and beliefs; and a badge that, in general, only initiated members wear.” Each sorority and fraternity has a *symbol* in the form of a unique hand gesture. Each combination of Greek letters as a name for a chapter can compare to a *language*. There are *norms* in Greek life, as shown by the levels of alcohol consumption demonstrated in existing literature (Cashin et al., 1998). Each Greek house has a set of *values* that every member pledges to uphold. An oath is taken to ensure compliance with the by-laws of each chapter. Finally, each Greek house has *artifacts*; these artifacts are in the form of composite photos, made up of every member that has ever existed, that line the walls of each Greek house on campus. With this information in mind, literature will now be reviewed on what culture may do to the brain.

*Culture and the Brain*

It has been shown that submersion in a culture may alter the structure or function of the brain; studies have been done to show that sustained experiences change neural structures (Park and Huang, 2010). One study explained by Park and Huang (2010) demonstrated how the grey matter in the posterior hippocampi was larger in London Taxi drivers who engaged in sustained wayfinding. Another study done by Draganski, Gasert, Busch, Schuierer, Bogdahn, and May (2004, p.311-312) demonstrated how “learning-induced cortical plasticity is reflected at a structural level” by scanning the brains of learning jugglers; the jugglers’ brains at the 3-month mark showed transient bilateral expansion in grey matter in the mid-temporal area and in the left
posterior intraparietal sulcus. These experiences are a part of submersion in a specific environment; culture and the process of assimilation, can be considered by these standards, a sustained environmental change. Culture as a sustained experience may consequently alter the anatomical and physiological structure of the brain; this could lend support to the idea that being a part of a maintained environmental change during college could lead to permanent changes in the structure and function of the brain following graduation. Changes in the structure of the brain could explain long-term, biologically founded, changes in drinking habits of Greek affiliated students compared with those of non-Greek graduates.

Alcohol’s Effect on the Developing Brain

Another explanation for maintained changes in drinking behavior following graduation could possibly be substance use-induced changes in developing brains. Many, including Zeigler et al. (2004), have studied the effects of alcohol on the adolescent and underage-college-student brain; the results show that, functionally, alcohol can affect long-term capabilities. As shown by Zeigler et al. (2004), consuming alcohol at such a young age leads to poor memory skills and impaired learning; also, the effects were shown on a structural level in that left and right hippocampal volume were smaller in those who had adolescent onset alcohol use disorder [determined by the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV Criteria] than in those non-drinking counterparts who matched for age, sex, and handedness. Long-term alcohol consumption has been associated with increased glutamate receptors on the hippocampus, and during alcohol withdrawal these receptors become overactive, leading to neuronal death (Oscar-Berman, Marinkovic, 2003). The chronic use of alcohol has been shown to correlate with brain shrinkage, especially in the frontal regions (Oscar-Berman, 2003). In post-
mortem studies and studies utilizing Diffusion Tensor Imaging (DTI) it has also been supported that heavy drinking disrupts the microstructure of nerve fibers, which correlate with behavioral tests of attention and memory (Pfefferbaum et al. 2006).

A longitudinal study comparing adolescent drinkers\(^1\), experimenters\(^2\), and nondrinkers\(^3\) on their behavioral patterns over a 10 year period was done by Ellickson, Tucker, and Klein (2003); the study measured substance use (and treatment in later years), academic/employment issues, and other problem behaviors (such as stealing, drug selling, predatory violence, etc) at grade 7, grade 12, and age 23. According to Ellickson et al. (2003), adolescent drinkers were most likely to exhibit substance use, academic issues, or any other problem behavior in grade 7; adolescent drinkers remained the most likely to show the aforementioned behaviors at the grade 12 analysis (with the exception of skipping class where they became equal with experimenters); adolescent drinkers at age 23 were again most likely to exhibit said delinquent behaviors (with the exception of stealing and receiving a warning on the job, in which they were equal with experimenters).

As demonstrated by Oscar-Berman and Marinkovic (2003), Oscar-Berman (2000), and Pfefferbaum et al. (2000) heavy drinking can affect the structure and function at the micro and macro levels of the brain. Such findings, in conjunction with those in Zeigler et al. (2004) and Ellickson et al. (2003), show the alcohol-induced changes in the brain behaviorally and chemically. This concept lends support to the idea that increased alcohol use in Greek students (who are underage until their third year) could explain long-term maintenance of such behaviors.

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\(^1\) Adolescent drinker: measured at grade 7, someone who drank 3 or more times in the past year, or in the past month

\(^2\) Experimenter: measured at grade 7, someone drank less than 3 times in the last year and not in the past month

\(^3\) Nondrinker: measured at grade 7, someone who has never had a sip of alcohol
The body of literature continues to show that Greeks consume more alcohol than non-Greeks (Capece and Knowles, 2015). The norms established in Greek life have been shown to cause other changes in behavior: affecting students’ health behavior such as condom use, cigarette smoking, and sexual partners (Scott-Sheldon et al., 2008). The explanation for this phenomenon may be attributed to Social Learning Theory. New definitions of normative behavior may take shape because of Greek life (Akers, 1985). Differential association is an important component due to the priority, intensity, frequency, and duration with which Greek members associate with one another. As the literature displays: differential reinforcement among peers takes place heavily in the Greek community; this is demonstrated by increases in alcohol consumption as Greek members get older (Capece and Knowles, 2015).

Biosocial model could also explain the nature of drinking in Greek life. Those who consumed alcohol during adolescence could have experienced the pressures to drink early on, leading to a biological influence on future drinking behaviors. The same can be said for Biosocial models explaining drinking following college; the pressures to drink during Greek life could lead to biological influences on drinking during adulthood. The cultural nature of Greek life could offer support for maintained drinking levels of Greeks following graduation. Culture as a sustained environmental influence could change the structure and function of the brain. Studies have shown (Park and Huang, 2010; Draganski et al., 2004) that consistent physical behavior has lead to alterations in grey matter at an anatomical level, and changes in neurofunctioning at a physiological level. Another change that can take place is due to the effects of alcohol on a developing brain. It was shown that the earlier in life alcohol is consumed, the more problem behaviors one exhibits later in life (Ellickson, Tucker, and Klein, 2003). This consistent behavioral pattern can be explained by a biological change taking place due to the long-term
exposure to alcohol consumption and how that alters the chemistry of the brain (Pfefferbaum et al., 2000). Once the influence of Greek life is no longer immediate, if drinking levels of Greeks continue to be more than those of non-Greeks, an alternate explanation should be offered for this phenomenon.

**PRESENT STUDY**

This study will explore whether or not graduates who were formerly members of Greek organizations consume more alcohol following graduation than their non-Greek counterparts. This research will be guided by Social Learning Theory and Biosocial models. Drinking habits of adults following graduation from university will be assessed. In addition to current drinking habits today, self-report data will be gathered of drinking habits when in college. Demographic data will be collected, including sex, year born, and relationship status. This information will add to the body of literature in showing the possible long-term effects of behaviors learned and practiced earlier in life. The first research question being investigated is whether or not involvement in a Greek organization during college impacts drinking levels while enrolled in college. The research question subsequently examined is whether or not active involvement in a Greek organization during college impacts drinking levels following graduation. Factors influencing these relationships will be determined, as well.

**HYPOTHESIS**

The study hypothesizes that those students who were involved in a Greek organization when at university will continue to consume alcohol at a higher rate than those who did not affiliate with a Greek organization at university following graduation.
METHODOLOGY

Sample and Survey Methods

The data utilized in this research came from a self-report survey (see appendix A) of undergraduate alumni of a major university in the southeast. The survey was administered through alumni Facebook pages using Qualtrics. The use of Qualtrics ensured anonymity using an encrypted webpage, and the link that was generated by the Qualtrics site was untraceable. The survey was blocked from being opened multiple times using the same IP address, so the respondent could only access the link one time on his/her computer. The link, along with a script describing the length of the survey, the purpose of the research, and who (alumni) was being asked to participate, was pasted into each Facebook page for respondents nationwide to access. Consent to participate was achieved by the statement on the survey introduction (see appendix B).

The sample was a sample of convenience; the method of sampling involved searching for Facebook pages for alumni of the university in the southeastern of the United States. These pages were deemed acceptable by the researcher so long as the title included the name of the university and the word “alumni,” or similar wording such as “graduates.” Additionally, each Facebook page was only accessed after the researcher was given online permission to post; permission was granted by an admin (any of the admin listed) of the private Facebook group giving the researcher online access to the page. Nineteen alumni groups were contacted, and nine of them allowed the researcher personal access. The remaining 10 groups either did not respond, or denied personal access, but posted the survey on the page themselves; there was little reliability in knowing if the survey was posted in the cases that the admins did not grant the researcher
access. The alumni groups ranged from localized groups of graduates in a certain city, to
nationwide groups with upwards of 1500 online members, with the smallest number of members
averaging at around 60. The survey was initially posted on May 10, and a follow up posting was
made on May 22, 2018. The total number of respondents was 219, but because of responses that
included empty fields, responses that had typing errors, outlier data, and non-uniform responses,
the total valid sample size was reduced to 112.

The test chosen to analyze the data was simple linear regression analysis. The test was
chosen because the dependent variables (average number of drinks per week during college and
average number of drinks per week now) are continuous variables.

Dependent Variables

The dependent variables include the respondents’ drinking levels during college and
following college. A drink was defined as a bottle of beer, a glass of wine, a wine cooler, a shot
glass of liquor, or a mixed drink (Core alcohol and drug survey, 1994). The questions asked
included “To the best of your ability, estimate how many drinks on average you consume per
week now?” and “To the best of your ability, estimate how many drinks on average you
consumed per week during college.” To measure the number of drinks consumed, respondents
simply entered the estimated number of drinks.

Independent Variables

The independent variable questions addressed Greek Affiliation. Greek life was defined
as an IFC fraternity or Panhellenic sorority. For this research, active involvement in a chapter
was defined as a dues-paying member who attends at least one Greek organized event throughout
the semester. This information was gathered by asking “Were you actively involved in Greek life?” The responses choices included “yes” or “no” (1=yes, 2=no). The independent variable to be included in the analysis was Greek status (Non-greek=0, Greek=1).

**Control Variables**

The analysis included three control variables: year born, sex, and relationship status. Age was calculated using the responses to the question “What year were you born?” The options provided for sex included “Male” or “Female;” (male=0, female=1). Relationship status was broken down into choices for the respondents: single, co-habitating, married, divorced, widowed, separated. Relationship status was coded as a series of dummy variables with marriage serving as the reference category (single=0, co-habitating=1, married=2). Age at First Alcohol Consumption was indicated with a free response box following the question “At what age did you have your first drink? (in any amount)

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4 The variables divorced, widowed, and separated were eliminated in the analysis for low cell count purposes.
RESULTS

Descriptive Statistics for Greek, Non-Greek, and the Total sample are reported in Table 1.

Table 1: Descriptive Statistics for Greek, Non-Greek, and the Total Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Greek</th>
<th>Mean</th>
<th>Freq. (valid %)</th>
<th>Non-Greek</th>
<th>Mean</th>
<th>Freq. (valid %)</th>
<th>Total</th>
<th>Mean</th>
<th>Freq. (valid %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Born</td>
<td></td>
<td>1979.79</td>
<td></td>
<td>1979.33</td>
<td>1979.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>27 (42.9%)</td>
<td></td>
<td>33 (63.5%)</td>
<td>57 (52.2%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>36 (57.1%)</td>
<td></td>
<td>19 (36.5%)</td>
<td>55 (47.8%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>30 (48.4%)</td>
<td></td>
<td>11 (22.0%)</td>
<td>41 (35.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-Habitating</td>
<td></td>
<td>7 (11.3%)</td>
<td></td>
<td>6 (12.0%)</td>
<td>13 (11.3%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>25 (40.3%)</td>
<td></td>
<td>33 (66.0%)</td>
<td>58 (50.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at First Alcohol Consumption</td>
<td></td>
<td>16.05</td>
<td></td>
<td>17.02</td>
<td>16.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Number of Drinks Consumed Today</td>
<td></td>
<td>4.33</td>
<td></td>
<td>3.48</td>
<td>3.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Number of Drinks Consumed During College</td>
<td></td>
<td>14.51</td>
<td></td>
<td>7.53</td>
<td>11.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The N for relationship status is 112 due to eliminating three cases (divorced)
The characteristics of Greek, non-Greek, and the full sample of respondents are summarized on the basis of their year born, sex, relationship status, age at first alcohol consumption, average number of drinks consumed per week during college, and average number of drinks consumed per week today. The average year born of Greek respondents was 1979.9 compared with the average year born of non-Greek respondents at 1979.33; the average year born for the total sample of people was 1979.58. The Greek sample had slightly more females than males with 57.1% female and 42.9% male. The non-Greek sample was distributed less evenly with more males than females making the distribution 63.5% male and 36.5% female. The relationship status characteristics of Greek respondents included primarily single persons (47.6%) with the next largest group being married (39.7%); those who answered “co-habitating” made up 11.1% of the Greek and the remaining 1.6% of the sample was comprised of 1 divorced respondent. The non-Greek persons in this study were primarily married (63.5%) with the second most common response being single (21.2%); those who responded “co-habitating” made up 11.5% of the sample and the final 3.8% was comprised of divorced respondents.

Age at first alcohol consumption had a mean of 16.49 for the full sample. Greek respondents first drank at a slightly younger age, on average, than non-Greek persons (16.05 vs. 17.02). The average number of drinks consumed weekly today varied slightly between Greeks and non-Greeks, with Greeks consuming marginally more alcoholic beverages (4.33 vs. 3.48). The mean weekly consumption of alcoholic beverages today for the full sample was 3.94. The alcohol consumption levels, on average, per week during college was much larger for Greeks than non-Greeks (14.51 vs. 7.53), with the full sample mean being 11.36.

Table 2 contains the linear regression analysis for average alcohol consumption per week during college.
### Table 2. Linear Regression Results for Average Number of Drinks Consumed Per Week During College

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>Exp(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>8.895***</td>
<td>2.300</td>
<td>0.333</td>
</tr>
<tr>
<td>Greek Status</td>
<td>4.040</td>
<td>2.509</td>
<td>0.150</td>
</tr>
<tr>
<td>Single</td>
<td>-3.139</td>
<td>2.990</td>
<td>-0.113</td>
</tr>
<tr>
<td>Co-Habitating</td>
<td>-2.211</td>
<td>3.940</td>
<td>-0.53</td>
</tr>
<tr>
<td>Year Born</td>
<td>0.248**</td>
<td>0.095</td>
<td>0.268</td>
</tr>
<tr>
<td>Age at First Alcohol Consumption</td>
<td>-1.887***</td>
<td>0.554</td>
<td>-0.297</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-454.269*</td>
<td>186.684</td>
<td></td>
</tr>
</tbody>
</table>

*significant at the .05 level  
**significant at the .01 level  
***significant at the .001 level

The results of the linear regression in Table 2 show that the significant predictors of alcohol consumption are sex, year born, and age at first alcohol consumption. The relationship between sex and alcohol consumption during college can be interpreted to say that females drank more than males (exp(b)=0.333, p=.000). The results of age at first alcohol consumption can be
interpreted to say that the younger one first consumes alcohol, the more he/she is to drink during college (\(\exp(b) = -0.0297, p=0.001\)). Year born is a significant predictor of alcohol consumption during college. The results display that the younger one is (as year born increases), the more he/she, on average, will consume alcohol during college (\(\exp(b) = 0.268, p=0.010\)). Greek status was not a significant predictor, when controlling for other factors, on alcohol consumption during college (\(\exp(b) = 0.150, p=0.110\)). Lastly, relationship status (married, single, or co-habitating) was not a significant predictor of drinking habits during college.

Table 3 shows the linear regression findings for average number of drinks consumed per week today.

**Table 3. Linear Regression Analysis for Average Number of Drinks Consumed per Week Today**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>Exp(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>2.200*</td>
<td>0.888</td>
<td>0.237</td>
</tr>
<tr>
<td>Greek Status</td>
<td>-0.168</td>
<td>0.968</td>
<td>-0.018</td>
</tr>
<tr>
<td>Single</td>
<td>0.461</td>
<td>1.154</td>
<td>0.048</td>
</tr>
<tr>
<td>Co-Habitating</td>
<td>0.745</td>
<td>1.521</td>
<td>0.051</td>
</tr>
<tr>
<td>Year Born</td>
<td>0.053</td>
<td>0.036</td>
<td>0.164</td>
</tr>
<tr>
<td>Age at First Alcohol</td>
<td>-0.383</td>
<td>0.214</td>
<td>-0.173</td>
</tr>
<tr>
<td>Consumption</td>
<td>(Constant)</td>
<td>72.062</td>
<td></td>
</tr>
</tbody>
</table>
The results of the linear regression in Table 3 indicate sex as the only statistically significant predictor of alcohol consumption levels today. On average, females drank more than males today ($\exp(b)=0.237, p=0.015$). Greek status was not a significant influence on alcohol consumption levels today; the results show that those who were non-Greek affiliated drank more alcohol today than those who were Greek affiliated ($\exp(b)=-0.018, p=0.862$). Relationship status (single, married, and co-habiting) did not approach statistical significance in predicting drinking habits today. Year born and age at first alcohol consumption were not a statistically significant factors in influencing average alcohol consumption levels now.

**DISCUSSION**

*Findings*

The purpose of this study was to examine the possibility that the increased drinking demonstrated in Greek organizations, compared with non-Greek affiliated students, during college would still be present following graduation. Two linear regression analyses were run. The first analysis was on the average alcohol consumption of respondents during college; the influencing factors tested were sex, relationship status, Greek status, age at first alcohol consumption, and year born. The second analysis looked at average drinking levels today. The same influencing factors were tested (sex, relationship status, Greek status, age at first alcohol consumption, and year born).

The hypothesis of this study that alumni who graduated from Greek organizations would drink significantly more today than those who did not graduate from a Greek organization was
unsupported. Greek status during college was not a significant predictor of drinking levels following graduation. The results of this study showed that at the univariate level, Greek respondents consumed more alcohol than non-Greek respondents; however, these effects disappeared at the bivariate level. The factors that significantly determined alcohol consumption levels during college were sex, age at first alcohol consumption, and year born. The statistical significance of age at first alcohol consumption and year born dissipated following college, but the significance of sex remained.

Sex was a significant factor in determining alcohol consumption levels during and following college; females were shown to drink more than males at both points in this study (during college and today). This gender difference can possibly be explained by the fact that women define alcohol consumption more positively than men, who associate alcohol consumption with arousal and aggression (Brown, Goldman, Inn, and Anderson, 1980). An explanation for the women continuing to drink more following college could be the tendency of drinking patterns to fluctuate with changes in drinking contexts and social roles for women (Wilsnack, Wilsnack, Hiller-Sturmhofel, 1994). These results could be evidence of social change or gender role differences existing today that did not exist during the time of previous research.

During college, year born was a significant predictor of alcohol consumption. Those who were younger consumed more alcohol. This could be explained by the propensity for underage students to drink with intentions of getting drunk, to get drunk three or more times in one month, and to consume more drinks, on average, on one occasion than students who are of the legal drinking age (Wechsler, Lee, Nelson, Kuo, 2002). Because underage drinking is no longer a present factor once the majority of people graduate college, the propensity for younger people to drink heavier may disappear too. These results can explain why the statistical significance of
year born disappeared following college as a factor determining alcohol consumption (because age no longer plays a role in access to alcohol).

Age at first alcohol consumption was a significant factor in determining alcohol consumption among those in college. Previous research supports the notion that those who consume alcohol earlier in life (during adolescence) have the greatest risk of developing alcohol abuse disorders later in life (DeWit, Adlaf, Offord, and Ogborne, 2000). Social Learning Theory is a strong predictor of alcohol use among adolescents, with the differential association aspect of Social Learning Theory having the strongest effect (Akers, et al., 1979). This suggests that the initial consumption of alcohol in adolescence, and maintenance of those behaviors during college, could be explained by Social Learning factors. However, the effects of age at first alcohol consumption is not significant following college. This could be due to Social Bond theory elements, as well as Life-Course theory.

Life-course theory could possibly explain the changes in drinking between college and today. The effects of age at first alcohol consumption on college drinking levels, according to the principles of Life-Course theory, would lessen as students leave adolescence (Moffitt, 2003). It has been shown that desistance in delinquent behavior is associated with life events occurring mainly in adulthood such as marriage, joining the military, and moving to a better location (Farrington, 2003). These aspects of Life-Course theory could also explain that year born loses its significant effect on alcohol consumption today because people are simply no longer in adolescence, and therefore age is no longer as relevant.

Past research shows that Greek affiliation is associated with heavier drinking and drinking in higher frequencies (Capece and Knowles, 2015). These results were not replicated in this study. Though the univariate analysis showed Greeks reported more drinking than non-
Greeks, these results were mediated by other factors in the bivariate analysis; this suggests that drinking is not related to Greek membership, but rather those who consumed alcohol earlier or who drank more underage were those who joined Greek organizations. These results could therefore also be an implication for a biosocial approach: predisposition to heavier drinking norms could be predictors of engaging in heavier alcohol consumption during college in places like Greek life, where that behavior is widely accepted. Those who are conditioned could develop a biological predisposition to heavy drinking norms, and then may seek an environment where those behaviors are conventional. A biosocial model may account for the differences in drinking levels between Greek and non-Greeks during college, not because Greek status causes heavier drinking, but because those who drink heavier all come together to join Greek organizations.

Limitations

The limitations of this study include the sample representativeness. The demographic breakdown of respondents was primarily White (non-Hispanic), which is unrepresentative of the demographic composition of the entire university in this study, but it was representative of the demographic make up of traditional Greek organizations at the university. Likewise, relationship status was very concentrated in its response frequencies among married, single, and co-habitating; this lead to exclusion of the categories divorced, widowed, and separated in the analysis. Further, the design of the study was one of convenience sampling. The survey was posted to only a single University’s alumnus Facebook pages, and only those ones that allowed access; this fact also makes the results unable to be generalized to the university alumni population. Another design concern was the necessity for recollection of events that occurred, on
average, almost 20 years ago. Self-report surveys can be unreliable in this respect, as people may underreport, not remember, or even lie about certain responses. Another limitation was in the survey composition. Future research should conduct more in-depth questioning regarding the level of involvement in Greek organizations. There are possible differences in drinking that correspond with levels of involvement that went unexplored in this study.

Implications

The implications of this study for future research would be to further examine the effects of Social Learning Theory on drinking behavior during adolescence. It would be useful to look into the duration of the effects of Social Learning Theory. Future research should also be conducted on the relationship between age at first alcohol consumption and seeking out an environment, such as Greek life, where heavy drinking behaviors are normative.

The policy implications of this study centrally point to early intervention programs. Due to the significant effects of age at first alcohol consumption in predicting drinking levels during college, it would be useful to identify those behaviors early on and implement strategies to mediate their impacts. Another policy implication on the part of the University would be in regards to underage drinking. Younger students significantly drank more than older students during college, which indicates that underage drinking is a concern. Universities could implement educational programs on harm reduction in regards to drinking for incoming freshman.
REFERENCES


Core Alcohol and Drug Survey [print]. Carbondale, IL: Core Institute Student Health Programs Southern Illinois University.


Appendix A

1. What year were you born?

2. Select your ethnic origin
   - American Indian/Alaskan Native
   - Hispanic
   - Asian/Pacific Islander
   - White (non-hispanic)
   - Black (non-hispanic)
   - Other

3. Select your sex
   - Male
   - Female

4. What is your relationship status?
   - Single
   - Co-Habitating
   - Married
   - Divorced
   - Widowed
   - Separated

5. What is your annual family income?

6. On average, how many hours per week do you work? (enter 0 if unemployed)

7. What was your undergraduate major?

8. What year did you graduate with your undergraduate degree from the University of Florida?

Greek Life* is defined as an IFC Fraternity or Panhellenic Sorority

Actively involved* is defined as a due-paying member who attends at least one Greek organized event throughout the semester

9. Were you actively involved* in Greek life*?
   - Yes
   - No

Those who selected “yes”  Those who selected “no”
A drink* is a bottle of beer, a glass of wine, a wine cooler, a shot glass of liquor, or a mixed drink

14. To the best of your ability, estimate how many drinks* on average you consume per week

15. To the best of your ability, estimate how many drinks* on average you consumed during college

16. At what age did you have your first drink* (in any amount)

17. How often do you socialize with friends made during college?
   - Weekly
   - Monthly
   - Semi-Annually
   - Annually
   - Never

18. How many drinks* do you believe it takes for you to become inebriated? (to exceed to legal driving limit of .08% BAC)

19. How many drinks* do you believe one has to consume in a 30 day period to be considered a heavy drinker?
Appendix B

My name is Kennedi Fichtel and I am a senior completing my degree in Criminology and Law at the University of Florida. I am engaging in a research project to complete my requirements to graduate with honors. As a University of Florida graduate, you are being asked to participate in the research entitled, “Long-term Effects of Greek Affiliation on Alcohol Consumption” designed to assess any difference among the drinking habits of Greek and non-Greek post-graduate students. Your responses are entirely voluntary and you may refuse to complete any part, or all of this survey. This survey is designed to be completely anonymous and it will be impossible to connect your responses with any of your personal identifying information. It should only take 5-10 minutes to complete and there are no direct benefits, risks, or compensation to you for participating. Only the researchers will have access to any of the information we collect online. There is minimal risk that the security of any online data may be breached, but since no identifying information will be collected, and the online host uses several forms of encryption, it is unlikely that a security breach will result in any adverse consequence for you. By completing and submitting this survey, you affirm that you are a University of Florida undergraduate alum and you agree to the use of your responses in this research project. If you have any questions about this research, or this survey, before or after its completion, please contact my project supervisor, Dr. Michael Capece in the Department of Sociology and Criminology & Law at 352-294-7192, or myself at 954-482-1411. If you have any questions regarding your personal rights as a research participant, please contact the UF Institutional Review Board at irb2@ufl.edu. If you agree to participate in this survey, please continue on to the following page.

Thank you and Go Gators!

Kennedi Fichtel