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Differential Drinking Patterns of Family History Positive and Family History Negative First Semester College Females

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Abstract

Objective—This study compares the natural drinking patterns of family history positive and family history negative women during their first semester of college, a transitional period known to coincide with considerable alcohol-related risks.

Method—Seventy-two incoming undergraduate females, approximately half of whom reported a family history of alcohol misuse, completed initial questionnaires as well as Timeline Followback assessments. In addition, participants completed five successive weeks of online behavioral diaries measuring three categories of prospective alcohol consumption: total drinks, maximum drinks, and heavy episodic drinking events. Repeated measures ANCOVA models, controlling for prior alcohol consumption, examined participants' drinking behavior.

Results—Over the course of the five assessed weeks, first semester females with a genetic predisposition to alcohol problems were found to consume significantly more total drinks ($p < .05$), maximum drinks ($p < .05$), and were more likely to drink heavily ($p < .05$) than family history negative peers.

Conclusions—Findings highlight increased alcohol-related risks faced by incoming first-year college females with a reported family history of problematic drinking and, thus, emphasize the need for early interventions targeted toward this at-risk group.

1. Introduction

Despite national attention focused on the high prevalence of drinking on college campuses as well as a plethora of studies addressing genetic predisposition to alcohol abuse, research examining the interlinkages between these two known risk factors is lacking. With nearly one-quarter of college students estimated to be frequent heavy episodic drinkers (defined as having consumed four or more drinks in a row for women or five or more drinks in a row for

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men in a two week period), heavy episodic drinking is considered the leading public health concern on college campuses (NIAAA, 2002; Wechsler, 2000). Recent rises in alcohol-related negative consequences include academic repercussions, car accidents, risky sexual behavior, psychological impairment, and delinquency (Hingson et al., 2002; Wechsler, 2002). There have also been steady increases in female students' drinking rates even though consumption levels among their male counterparts have remained relatively stable (Berkowitz and Perkins, 1987; Holdcraft and Iacono, 2002; Pullen, 1994; Wechsler et al., 2002). This is particularly problematic given women's increased susceptibility to the harmful consequences of intoxication. Compared to males, females have a physiological makeup that results in slower metabolization of alcohol, thus increasing their vulnerability to addiction, memory loss, compromised judgment, physical injury, sexual victimization, and adverse health problems such as liver or cardiovascular disease (Jersild, 2002; Mumenthaler et al., 1999; Randall et al., 1999).

Research has consistently linked college attendance with increased alcohol consumption (Hingson et al., 2002; Toomey and Wagenaar, 2002; White et al., 2006; White and Jackson, 2004). In a 2002 longitudinal study, O'Malley and Johnston found that although college bound students drank less than non-college bound peers while in high school, once in college the former became heavier drinkers surpassing even their high school classmates in consumption rates. Specifically, the transition to college is a disruptive event that may pose significant alcohol-related hazards (Berkowitz and Perkins, 1987; Schulenberg and Maggs, 2002; White et al., 2006). The first six weeks of college attendance, for instance, are considered crucial in influencing students' first year success (NIAAA, 2002). It is during the initial weeks of college that students often establish drinking behaviors that may persist throughout the college years, and possibly beyond. Upon matriculation into college, students are presented with an independent living situation removed from parental oversight, in which underage drinking is culturally acceptable, and alcohol is readily available and at the forefront of social life. The pervasiveness and popularity of alcohol at social gatherings may be particularly appealing to women since establishing relationships is thought to be a fundamental component of female identity and positive sense of self (Gleason, 1994).

College surroundings may also be acutely risk-enhancing for students already predisposed to alcohol problems, such as those with a positive family history of alcohol abuse (FH+). Extensive literature has identified the presence of family history of alcoholism as one of the strongest predictors of alcohol abuse and dependence (Hinckers et al., 2006; Kuntsche, 2004; Pullen, 1994; Turnbull, 1994; Warner et al., 2007). Yet studies that have examined the heritability of problematic drinking among college students are not only in short supply, but have inconsistent findings (Baer, 2002). While Bogart and colleagues (1995) found no significant differences in alcohol consumption or expectancies in female college students regardless of parental alcoholism status, two separate studies of comparable sample sizes revealed increased likelihood of alcohol use disorders among children of alcoholics (COAs) as compared to non-COAs (Kushner and Sher, 1993; Pullen, 1994). In another study of college students, Perkins and Berkowitz (1991) determined that having an alcoholic parent or grandparent significantly predicted heavy alcohol consumption and frequent intoxication. Moreover, students at greatest risk for drinking problems were found to be those with both an alcoholic parent and alcoholic grandparent. None of these studies, however, focused on college entry and only Kushner and Sher collected data prospectively. The present investigation offers unique insight into the drinking patterns of incoming female college students by prospectively following their drinking behavior through five weeks of the first semester of college.

Much of the family history of alcohol abuse research suggests that women have greater propensities for genetic ramifications than men (Ackerman and Gondolf, 1991; Berkowitz

and Perkins, 1988). Curran and colleagues (1999) reported that socioeconomic status most significantly predicted alcohol dependency in men while family history was most salient to women. Studies by Sher et al. (1991) and Kushner and Sher (1993) found interaction effects between gender and parental alcoholism on children's alcohol risk factors and disorders, such that women who had an alcoholic parent were more likely to suffer adverse consequences than men. College settings may be particularly perilous for FH+ women. Compared to those without a family history of alcohol problems, FH+ individuals have shown greater impulsivity and lack of behavioral control, reduced physiological responsiveness to alcohol, increased coping motivations to drink, higher alcohol expectancies, and lower self-esteem (Baer, 2002; Beaudoin et al., 1997; Chalder et al., 2006; Pastor and Evans, 2003; Sher et al., 1991). The unique personalities exhibited by FH+ individuals may put them at significantly greater risk than FH- individuals for succumbing to pressures of irresponsible alcohol consumption in college.

The present study utilized a sample of first semester college women to examine how patterns of collegiate alcohol consumption differed by family history status. To our knowledge this is the first study to investigate how genetic predisposition to problematic drinking may differentially impact women during the pivotal initial weeks of college. It was hypothesized that first semester college women who reported a family history of problematic alcohol use would be more susceptible to the alcohol pervasive environment of college than those without known familial ties to alcohol-related problems. Therefore, FH+ women were expected to exhibit riskier drinking patterns than FH- women.

II. Method

II.1 Sample

Participants were a sub-sample of a larger intervention study of 287 incoming first-year college women at a mid-sized private university. As the current study sought to examine how natural drinking patterns changed upon entering college, only control group participants ($N = 126$) who were classified as drinkers (reported drinking in the month prior to entering the study, $N = 78$) were included in the analysis. Among those participants meeting the above criteria, 92.3% ($N = 72$) completed measures at all time points. Between cases with and without complete data, no significant differences were found on any of the demographic variables. This final sample of non-abstaining participants in the past month had a mean age of 17.99 ($SD = .20$) years. Racial composition was 62.8% White/Caucasian, 14.1% Hispanic/Latino, 9.0% Asian, 6.4% Black/African American, 3.8% indicated "more than one race," and the remaining 3.8% indicated "other." Thirty-four (43.6%) reported having at least one relative who "had a history of alcohol abuse" and were designated as FH+; the rest were classified as FH-

II.2 Procedure

During the summer of 2006, all incoming first-year college females received letters requesting their participation in "a study on women's values and attitudes toward drinking and health issues." Once on campus, each woman received a follow-up e-mail requesting her participation. If the student accepted, she clicked on a link and electronically "signed" a local IRB-approved informed consent form before completing an online questionnaire, which contained questions concerning demographics and family history of alcohol abuse. At the end of this initial questionnaire, each participant selected a group session to attend. The group sessions were randomly assigned to be either intervention or control but the participants were blind to condition when they selected their group. Sessions occurred over the course of two weeks near the end of the first month of college. During the control group sessions, respondents individually completed 90-day Timeline Followback assessments

(TLFB; Sobell and Sobell, 1992). Subsequent data collection included five weekly online diaries, in which respondents recorded the number of drinks they had consumed on each day of the past week. Respondents received nominal stipends for completing initial questionnaires, attending group sessions, and for completing each weekly online diary.

II.3 Measures

The initial questionnaire assessed demographic information including age, race, college of study, and family economic level.

II.3.1 Family History—Each participant was asked which, if any, of her “biological relatives (mother, father, grandmother/grandfather, uncle/aunt, cousin, sibling) had a history of alcohol abuse.” Participants subjectively ascertained the presence or absence of familial alcohol abuse. Those in the sample denoting familial problematic alcohol use were designated FH+ while all others were designated FH-. Research supports that the odds of alcohol dependence are significantly increased among persons with alcohol abuse in first, second, and third degree relatives (Dawson et al., 1992).

II.3.2 Alcohol Use—Baseline alcohol use was measured with variables from the in-group Timeline Followback assessments. Previous research has shown that an in-group TLFB yields equivalent data as a one-on-one TLFB (Pedersen & LaBrie, 2006). For each respondent, the TLFB was used to compute total drinks consumed in the past month, maximum drinks consumed on any occasion in the past month, and heavy episodic drinking events within the past two weeks. Heavy episodic events were defined as having consumed four or more drinks in a two hour period.

Prospective drinking was measured using weekly online behavioral diaries. Previous research has revealed that electronic web-based data collection increases accessibility and the notion of anonymity, which may result in higher response rates, increased validity of data, and lower attrition rates than mailed or in-person assessments over a prolonged period of time (Neighbors et al., 2004; Saitz, et al., 2004). From these online behavioral diaries, in which participants indicated how many drinks they consumed each day, we computed total drinks, maximum drinks, and heavy episodic drinking events for each of the five weeks.

II.4 Data Analysis

Descriptive statistics concerning family history composition and baseline drinks were first examined. Next, repeated-measures ANCOVA analyses were undertaken in which time (weeks 1 to 5) was specified as the within-subjects factor, and family history (positive or negative) was specified as the between-subjects factor. Drinking variables from the TLFB (total drinks, maximum drinks, and heavy episodic events) served as covariates to control for prior drinking. Dependent measures were drinks per week, maximum drinks, and heavy episodic events assessed weekly across five weeks.

III. Results

Examination of initial questionnaires revealed that participants were least likely to indicate a sibling (1.3%) and most likely to report a grandparent (28.2%) as being abusive of alcohol. Alcohol abuse was perceived to be more common among fathers (12.8%) than mothers (2.6%). In addition, uncles/aunts and cousins represented 24.4% and 5.1% of the reported instances, respectively. Due to the relatively low percentages of specific family members identified by participants as abusive of alcohol, FH+ was operationally defined as reporting at least one of these five categories of family members with a history of problematic alcohol

use (43.6%) in all subsequent analyses. Demographic characteristics of FH+ and FH- groups are shown in Table 1.

On the TLFB, FH+ women consumed an average of 24.62 total drinks ($SD = 25.71$) in the past month, drank a maximum of 5.59 ($SD = 3.43$) drinks on any given occasion in the past month, and experienced 1.62 ($SD = 1.97$) heavy episodic events in the past two weeks. Among FH- women, means were 21.53 ($SD = 23.95$) total drinks, 5.78 ($SD = 3.55$) maximum drinks, and 1.61 ($SD = 1.87$) heavy episodic events. Between FH+ and FH- groups, no significant differences emerged on any of these baseline TLFB measures.

Comparisons of FH+ and FH- women's first semester drinking patterns (Figure 1) revealed several statistically significant differences. Repeated-measures ANCOVA models found family history main effects on total drinks, $F(1, 67) = 4.30, p < .05$, maximum drinks, $F(1, 67) = 5.15, p < .05$, and heavy episodic drinking, $F(1, 67) = 6.34, p < .05$. These results indicate that, even after controlling for baseline drinking, FH+ female participants consumed significantly more than FH- female participants across five weeks of the first semester of college. Further, after controlling for baseline drinking, no time effects emerged on total drinks, $F(4, 268) = .36, ns$; maximum drinks, $F(4, 268) = .42, ns$; or heavy episodic drinking, $F(4, 268) = 1.18, ns$. Further, no statistically significant family history x time, interactions were discovered on total drinks $F(4, 268) = 1.16, ns$; maximum drinks, $F(4, 268) = 0.97, ns$; or heavy episodic events, $F(4, 268) = 1.41, ns$. Such non-significant findings show that the drinking patterns for FH+ and FH- groups, albeit different, remained relatively stable across time.

Though the research was designed to examine differences in drinking patterns among women who were already drinkers prior to entering college, additional analyses determined whether these findings were replicable with the entire control group cohort. In this sample, 41.6% were classified as FH+. Between the FH+ and FH- women, statistically significant family history main effects were evidenced on total drinks, $F(1, 112) = 3.52, p = .06$, maximum drinks, $F(1, 112) = 4.11, p < .05$, and heavy episodic drinking. $F(1, 112) = 5.46, p < .05$. No significant time effects or family history x time interactions emerged. Mean drinking for both groups, although lower across the five weeks, were similar to that of the patterns shown in Figure 1.

IV. Discussion

Findings from this sample of first-year college females indicate that students with a reported family history of alcohol abuse consume significantly greater amounts of alcohol during the initial weeks of college than students without a reported family history of alcohol abuse. Despite showing no baseline differences in alcohol usage, FH+ females exhibited riskier drinking patterns throughout the assessed five weeks than FH- respondents in all categories of alcohol consumption, including total drinks, maximum drinks, and heavy episodic drinking events. Results confirm prior studies that show greater alcohol vulnerability for college females with a family history of problematic drinking than without (Kushner and Sher, 1993; Perkins and Berkowitz, 1991; Pullen, 2001). In addition, our study extends earlier research by focusing on differential patterns of FH+ and FH- women's alcohol consumption during the critical first semester of college. Such early assessment is advantageous when investigating the impact of family history on collegiate drinking as it captures patterns of alcohol usage before higher risk students may drop out. Overall, the current findings offer unique insight by suggesting that the alcohol-related perils posed by college transitions may be population-specific.

Similar baseline consumption levels in conjunction with significantly different drinking patterns between FH+ and FH- respondents point to college entrance as a risk factor for

excessive alcohol use among females with genetic predispositions to problematic drinking. It appears that college cultures and environments, which tend to condone and even encourage alcohol consumption, may trigger increased drinking among FH+ women. Further, FH+ women may be more likely to manage challenging college transitions through drinking than their FH- peers. Yet regardless of family history status, respondents maintained fairly stable levels of alcohol consumption and heavy episodic drinking across the five measured weeks. This finding further emphasizes the importance of drinking decisions made during the initial few weeks of college.

Study Limitations

One limitation of the present investigation is the fairly small sample size. Due to lack of respondents, we were restricted to a broad operationalization of the family history of alcohol abuse variable, in which parents, grandparents, uncles, aunts, cousins and siblings were merged. Though the current findings highlight the significance of family history of problematic alcohol usage regardless of the relationship to the respondent, future studies examining the distinctive roles of first, second, and third degree heritability appear warranted. Additionally, it is important to note that FH status was derived from participants' conventional assessment of alcohol abuse, and was not specifically defined in any way. Results are thus anchored in participant perceptions rather than DSM-IV criteria and must be interpreted as such. Finally, the findings from this study should be qualified by the limitation that the current sample consists of students from one mid-sized private university on the West Coast. Since rates of collegiate alcohol consumption are shown to be highest in Northeast and North Central regions and lowest in the Western region of the U.S., results may under represent the drinking behavior of typical college women in the United States (O'Malley and Johnston, 2002).

Conclusions

The present study prospectively recorded the natural drinking patterns of first-year college women over five weeks early in their first semester of college. Overall, we found that first semester FH+ females consumed significantly more alcohol and were significantly more likely to drink heavily than first semester FH- females. The short-term hazards of excessive alcohol consumption among FH+ college women can lead to a host of physical and emotional injuries while potential long-term implications include persistence of heavy drinking and alcohol dependence after college (Jennison, 2004). A pattern of greater consumption in the first semester of college by genetically predisposed female college entrants emphasizes the need for prevention efforts targeted toward this at-risk group. Non-judgmental and non-coercive interventions taking place during the first weeks of college should aim to help FH+ females better understand the dangers associated with drinking and why they might be inclined to use alcohol to cope with new college surroundings. It may be helpful to address the issues of family alcohol history and the specific risks associated with it in these interventions. Further, studies using large samples of FH+ and FH- females that differentiate genetic linkages to alcohol problems and follow weekly consumption patterns throughout the entire first year of college would be constructive.

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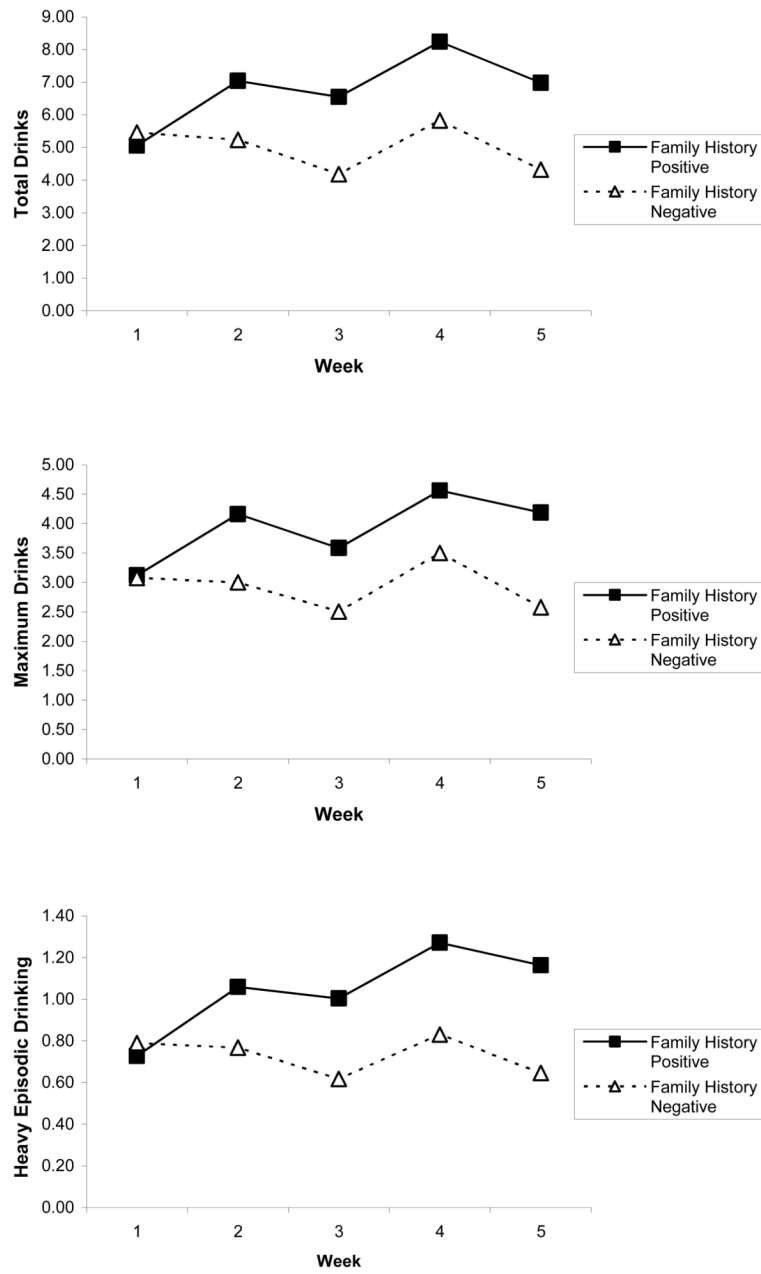


Figure 1. Total drinks, maximum drinks, and heavy episodic drinking by participants with and without a perceived family history of alcohol abuse during the first semester of college.

Table 1
Demographic Characteristics of Family History Positive and Family History Negative Women

Demographic characteristic	Family History Positive		Family History Negative		p-level ^a
	n	Percent	n	Percent	
Age (M, SD)		(17.94, .24)		(18.02, .15)	ns
Race					<.05
White/Caucasian	23	67.6%	26	59.1%	
Hispanic/Latino	8	23.5%	3	6.8%	
Asian	0	0.0%	7	15.9%	
Black/African American	2	5.9%	3	6.8%	
More than one race	0	0.0%	3	6.8%	
Other	1	2.9%	2	4.5%	
College of study					ns
Liberal arts	11	32.4%	14	31.8%	
Science and engineering	3	8.8%	4	9.1%	
Business	11	32.4%	10	22.7%	
Communications and fine arts	9	26.5%	13	29.5%	
Film and television	0	0.0%	3	6.8%	
Family economic level					ns
Much higher than most families	3	8.8%	2	4.5%	
Moderately higher than most families	12	35.3%	19	43.2%	
About average	14	41.2%	22	50.0%	
Moderately lower than most families	5	14.7%	0	0.0%	
Much lower than most families	0	0.0%	1	2.3%	

^a T-test performed on age, and chi-square tests performed on all other demographic variables.