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Can Parents Prevent Heavy Episodic Drinking by Allowing Teens to Drink at Home?

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Abstract

The current study examined whether permitting young women to drink alcohol at home during senior year of high school reduces the risk of heavy drinking in college. Participants were 449 college-bound female high school seniors, recruited at the end of their senior year. Participants were classified into one of three permissibility categories according to their baseline reports of whether their parents allowed them to drink at home: (a) not permitted to drink at all; (b) allowed to drink with family meals; (c) allowed to drink at home with friends. Repeated measures analysis of variance was used to compare the drinking behaviors of the three groups at the time of high school graduation and again after the first semester of college. Students who reported being allowed to drink at home during high school, whether at meals or with friends, reported more frequent heavy episodic drinking (HED) in the first semester of college than those who reported not being allowed to drink at all. Those who were permitted to drink at home with friends reported the heaviest drinking at both time points. Path analysis revealed that the relationship between alcohol permissiveness and college HED was mediated via perceptions of parental alcohol approval.

Keywords

adolescent; alcohol use; parenting; heavy episodic drinking; college

1. Introduction

Heavy episodic drinking (HED) among college students is pervasive and has been associated with a myriad of negative outcomes. Although HED can have adverse consequences for both males and females, young college women are particularly vulnerable to being sexually assaulted following HED (e.g., Parks, Romosz, Bradizza, & Hsieh, 2008). Indeed, nearly 75% of college sexual assaults occur as a result of the woman drinking to the point of unconsciousness or incapacitation and being unable to resist sexual advances (Mohler-Kuo,

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Dowdall, Koss & Wechsler, 2004; Testa & Livingston, 2009). The potential for HED and its consequences to adversely impact adult development and well-being, especially for young women, makes prevention of underage college drinking a public health priority (National Institute on Alcohol Abuse and Alcoholism, 2007). One possible conduit for prevention of HED is through parents. Families play an instrumental role in socializing adolescents into adult drinking practices and parents continue to exert influence on their children's drinking behavior even in late adolescence, extending into college (Abar & Turrisi, 2008; Martino, Ellickson, & McCaffrey, 2009; Turrisi, Jaccard, Taki, Dunnam, & Grimes, 2001; Wood, Read, Mitchell, & Brand, 2004).

Entry into college is a significant transitional period in the lives of parents and their children. It is also a period in which teen alcohol consumption tends to escalate (Borsari, Murphy, & Barnett, 2007; Parks et al., 2008; White, et al., 2006; Wood et al., 2004). Just as teen alcohol use starts to accelerate during the transition from high school to college, parents may begin to loosen their controls and become more tolerant of drinking behavior (Martino et al., 2009; van der Vorst, Engels, Meeus, Dekovic, & Leeuwe, 2005). As the end of high school draws near, parents may even begin to provide or allow their teen to drink at home, rationalizing that they are teaching their children to drink responsibly and thereby reducing risk of alcohol-related consequences (Livingston, Testa, & Baker, 2009; Peele, 2007). The goal of the current study was to test this popular belief in order to determine whether permitting supervised drinking during high school reduced HED among emerging adult women as they transitioned from high school to college.

The question of whether allowing teens to drink at home under adult supervision can indeed reduce HED among adolescents and emerging adults has been the subject of controversy. On the one hand, the argument that permitting supervised drinking in a controlled environment promotes low-risk alcohol use among teens has intuitive and popular appeal (e.g., see Peele, 2007) and can be supported theoretically. For example, the principles of social learning theory (Bandura, 1977) would dictate that when parents model and permit light drinking in low-risk contexts, such as having a glass of wine with dinner, they are socializing their adolescent child to engage in low-risk drinking behavior. According to social learning theory, it is the social context in which drinking is modeled and permitted that influences future behavior rather than the permissiveness itself. Permitting drinking in settings where heavy drinking is normative (e.g., a party) is unlikely to be protective since the adolescent would be exposed to heavy drinking models. Consistent with this, Foley, Altman, Durant, and Wolfson (2004) found that adolescents who drank with their parents at home were less likely to regularly use alcohol or binge drink in the two weeks preceding the assessment as compared to adolescents whose parents allowed them to drink at parties.

Alternatively, it could be argued that by allowing adolescents to engage in any drinking, regardless of context, parents may be inadvertently communicating that they condone drinking, thereby spurring drinking in less restrictive contexts. Adolescents infer parental alcohol approval from various parent behaviors and permitting adolescents to consume alcohol is an overt expression of such approval. Adolescents tend to believe that their parents are more accepting of underage drinking than the parents report that they are (van der Vorst, Engels, Meeus, & Dekovic, 2006) and perceived parental approval of drinking has been linked to heavy drinking among high school and college students (e.g., Abar, Abar & Turrisi, 2009; Barnes & Welte, 1986; Wood et al., 2004). In support of the argument that permitting drinking at home promotes drinking in other contexts, van der Vorst, Engels, and Burke (2010) found that adolescents who were permitted to drink at home also were more likely to drink outside of the home and to report more alcohol problems over a two year period than those who were not permitted to drink at all.

In addition to parental alcohol permissiveness, a variety of other alcohol socialization factors influence underaged drinking as well. Strong parent-child communication about alcohol use and general communication about the adolescent's activities (i.e. monitoring) have been associated with lower rates of college HED (e.g., Borsari et al., 2007; Testa, Hoffman, Livingston & Turrise, 2010; Wood et al., 2004). On a global level, parental drinking also has been positively associated with adolescent drinking (e.g., Jackson, Henriksen, & Dickinson, 1999; Windle, 2000). One explanation for this is that adolescents are influenced directly by parental modeling of heavy drinking; however, multivariate models suggest that the influence may be indirect, occurring via mechanisms such as peer selection, positive alcohol expectancies, perceived approval of drinking, reduced monitoring, or tolerance of underaged drinking behavior (Borsari et al., 2007; van der Vorst et al., 2006; Windle, 2000). Effects of parental drinking may also be moderated by gender. For example, father's drinking, but not mother's, is predictive of the drinking behavior of adolescent boys, suggesting that the behavior of the same-sex parent may be particularly relevant to establishing drinking norms (Zhang, Welte, & Wieczorek, 1999).

Study Framework

The current study examined the role of parental alcohol permissiveness and other parental alcohol socialization factors on the alcohol use of young women making the transition from high school to college. Data collection was prospective, beginning as the young women graduated from high school in June and following them through spring of their first year in college for a total of three assessment points, conducted at baseline and at the end of each semester. Because the study focused on how mother-daughter interactions can influence underaged drinking, data were collected from mothers as well. In this study, parental alcohol permissiveness is defined as allowing or permitting adolescent daughters to consume alcohol, regardless of whether or not the alcohol is provided by the parent. Because drinking behavior can vary according to the context in which drinking is permitted (e.g., Foley et al., 2004), three permissiveness groups were considered in these analyses: no drinking permitted, permitted to drink with family meals and permitted to drink at home with friends. If permitting moderate drinking at home (i.e. with meals) is protective as is commonly believed, it would be expected that adolescent girls who were allowed to drink at home with meals would engage in less frequent HED at baseline and in college than those who were allowed to drink at home with friends. It was anticipated that drinking across all groups would increase as the young women transitioned to college (e.g. Parks et al., 2008), with the highest rates of HED occurring among those permitted to drink with friends. To the extent that being allowed to drink at family meals is protective, we would expect a permissiveness context by time interaction, such that HED should increase least among the group allowed to drink at meals.

Recognizing that group membership was not randomly assigned, the three permissiveness groups were also compared to determine whether they differed on other alcohol socialization factors that have been associated with adolescent drinking including mother-daughter communication, parental monitoring, and mother's alcohol use. It was expected that parent alcohol socialization behaviors previously associated with heavier adolescent drinking (i.e., poor communication, low monitoring, greater parental alcohol use), would be linked to heavier drinking at baseline and in college, and would be more characteristic of permitting drinking with friends than of no drinking or permitting drinking with meals. While the role of father's drinking on their son's drinking has been examined in previous research (e.g., Zhang et al., 1999), there is little data examining mothers' influence on daughters' drinking during college. The current study allowed the opportunity to examine the role of mothers' drinking on their daughters' college drinking behavior.

We were also interested in examining mothers' perceptions of their daughters' drinking and how this was related to permissiveness and daughters' actual drinking over time. Because mothers tend to underestimate their children's drinking (Guilamo-Ramos, Jaccard, Turrisi, Johansson, & Bouris, 2006), we anticipated that mothers' reports of daughters' drinking would be lower than daughters' reports of their own drinking at both baseline and follow-up. Given the exploratory nature of the analyses, there were no predictions about the relationship between parental alcohol permissiveness and mothers' perceptions of daughters' drinking.

Finally, we explored the association between permissiveness and perceived parental approval. It is well known that perceived parental approval of drinking is positively associated with actual drinking (e.g., Abar et al., 2009; Wood et al., 2004). However, it is not known how parental permissibility around alcohol in the home might influence perceived parental approval. For example, women whose parents allowed them to drink with friends were expected to report higher perceived parental alcohol approval than those not allowed to drink at all. However, it was not known whether being allowed to drink with meals (but not with friends) would convey similarly higher parental approval of drinking. Moreover, we explored whether perceived alcohol approval served as the mechanism by which permissibility was associated with daughters' HED.

2. Method

2.1 Participants and Recruitment

Participants were 449 female college freshmen and their mothers who served as a control group for a randomized controlled trial (see Testa et al., 2010). They were recruited by telephone, just prior to high school graduation, from households in Erie County, NY. At the time of recruitment students were on average 18.1 (.33) years old. The majority were Caucasian (90.9%, compared to 82.2% Caucasian for the county) and came from households with a median income of \$75,000, which is close to the median income of \$74,000 for college freshmen nationally (Pryor, Hurtado, Saenz, Santos, & Korn, 2007). In the fall semester students attended over 100 different colleges; however, the majority of students attended colleges in Western New York.

2.2 Procedures

Potential participants were selected at random from yearbook photos from local city and suburban high school graduating classes of 2004, 2005, 2006, and 2007. They were located using public telephone directories, and students and their mothers were offered the opportunity to participate in a longitudinal study of young women's transition to college. To be eligible, the graduating senior had to be planning to enter a 2 or 4 year college in the fall, be living with her mother (or a mother figure, such as a grandmother) and both mother and daughter had to agree to participate and provide written informed consent. Of 1354 high school seniors who were contacted, 133 were ineligible (primarily because they were not planning to attend college in the fall) and 1068 (78.9%) agreed to participate. Procedures were described by telephone to mothers and daughters and written informed consent, or assent in the case of daughters who were not yet 18, was obtained. Because some daughters were minors, we requested written informed consent from all mothers regarding daughter's participation. After receipt of written informed consent, mothers and daughters were sent, under separate cover, baseline questionnaire booklets to complete at home and return in a postage-paid envelope. Baseline questionnaire booklets, sent in May or June of senior year (Time 0 or T0), were completed by 992 (92.9%) students. After completion of baseline measures, participants were randomly assigned to an intervention (N = 523) or control (N = 469) condition. Only participants from the control condition who completed both baseline and follow-up measures (N = 449 or 95.7%) were included in these analyses. Follow-up 1 (FU1) questionnaires were sent to mothers in

November and to daughters at the end of the first college semester (December, time 1 or T1). Daughters also received a second follow-up questionnaire booklet (FU2) at the end of the second semester (April, time 2 or T2). Participants were paid \$30 for completing baseline questionnaires and \$50 for follow-ups. All procedures were approved by the Social and Behavioral Sciences IRB at the University at Buffalo.

2.3 Measures

For all measures completed by both mothers and daughters, daughters' reports were used, with the following exceptions: a) mother's demographics (e.g., education, income); b) mother's alcohol use; and c) mother's perceptions of daughter's HED, in which mothers' reports were used. We elected to use daughters' reports whenever possible because the daughter's perception of permissibility, even more than the actual rules, is likely to influence her beliefs and drinking behavior. Teen measures are also more predictive of teen behavior than are parents' measures (Jaccard, Dittus, & Gordon, 1998). Mothers' and daughters' measures in this study were reasonably correlated.

2.3.1 Alcohol consumption—Mothers and daughters were both asked to self-report on their alcohol consumption during the past 90-days at baseline and at follow-ups. A 90-day window was chosen to correspond roughly to the length of a semester.

2.3.1.1 Average drinking: Mothers were asked to indicate the average number of drinks consumed on a typical occasion in the past 90 days, using a 7-point scale: 0 'None', 1 'Less than 1 drink', 2 '1–2 drinks', 3 '3–4 drinks', 4 '5–7 drinks', 5 '8–10 drinks' and 6 'More than 10 drinks'.

2.3.1.2 Weekend drinking: Daughters reported the number of drinks they typically consumed on each day of the week, using an open-ended format. Because most alcohol consumption, particularly heavy alcohol consumption, occurs on the weekend, weekend drinking was calculated by summing the total number of drinks typically consumed on Friday and Saturday.

2.3.1.3 Frequency of Heavy Episodic Drinking: Two questions were used to assess frequency of HED: frequency of drinking 4 or more drinks on an occasion and frequency of drinking to intoxication. Responses were on a 6-point Likert scale: 0 'never', 1 'less than once a month', 2 '1–3 times a month', 3 '1–2 days a week', 4 '3–4 days a week', and 5 '5 or more days per week'. Because items were highly correlated (.85 at baseline, .91 at follow-up) they were averaged to form a single measure of frequency of HED.¹

2.3.2 Mothers' perceptions of daughters' HED—Mothers were also asked to indicate their perceptions of the frequency of their daughters' HED, during high school at in college, using the same two items described above. These items were also highly correlated (.79 at baseline and .72 at follow-up) and thus were averaged to form a single measure of perceived daughters' HED.

2.3.3 Permissiveness—Parental alcohol permissiveness during high school was assessed at baseline and at follow-ups at the end of the fall and spring semesters with two questions: “Do your parents allow you to drink alcoholic beverages at family meals?” and “...in your home with your friends?” Mothers also reported on whether they allowed their daughters to “drink alcoholic beverages at family meals” and “in your home with her friends,” both at

¹Some mothers (N=188) were randomly assigned to a control group that completed T1 measures but not baseline (T0) measures. For these mothers, we substituted T1 measures of alcohol use. The correlation between mothers' frequency of HED at baseline and follow-up 1 was .82 for those who completed both assessments, suggesting that mothers' drinking was stable over the 5-month interval.

baseline and at the end of the first semester. The correlation between participants' and their mothers' permissiveness reports was $.55$, $p < .01$, with daughters tending to report more permissiveness than mothers.

Respondents were classified into one of three groups according to whether they were allowed to drink during high school, as indicated on the daughter's baseline reports. These included: those who were not permitted to drink at home (ND; $n = 295$; 63.0%), those permitted to drink at least occasionally at family meals but not with friends (DWM; $n = 101$; 21.6%) and those who were permitted to drink at least occasionally at home with friends (DWF; $n = 72$; 15.4%). Because we believed that being permitted to drink with friends reflected a higher, and more risky level of parental permissiveness than drinking with family meals (Foley et al., 2004), respondents who reported being permitted to drink in both contexts ($n = 40$) were classified in the drink with friends category.

2.3.4 Exposure to maternal drinking—To determine daughters' exposure to maternal heavy drinking, at baseline daughters were asked to indicate how often they had seen their mother intoxicated. Responses were on a 5-point Likert scale ranging from 1 (Never) to 5 (Daily).

2.3.5 Perceived mother's approval of daughter's drinking—Perceived drinking approval was measured with 8 items asking daughters to rate how their mother would respond if she knew that the daughter engaged in various drinking behaviors, including not drinking at all (reverse scored). Sample items include, "How would your mother respond if she knew you drank alcohol every weekend; ...you got drunk; ...you had a drink once in awhile?" Responses were made on a 7-point scale ranging from 1, "Strong disapproval" to 7 "Strong approval" ($\alpha = .71$). The mean of the 8 items was used as the measure of approval.²

2.3.6 General Communication—At baseline, daughters responded to 5 items assessing mother-daughter communication that were based on a commonly used measure of parental monitoring (e.g., "how often do you tell your mother where you're going after school?" (Barnes, Welte, Hoffman, & Dintcheff, 2005). Responses were based on a 5-point scale from 1 (never) to 5 (always). Because the majority of daughters were no longer living with parents during the first semester, follow-up items were modified to assess daughter's willingness to tell her mother about school, social activities, personal issues, romantic relationships, and personal problems. Mothers answered corresponding questions regarding how often their daughters talked to them about these topics. All follow-up items were rated on 7-point scales ranging from 1 (not at all) to 7 (frequently). The mean of the five measures was used as the measure of general communication. Cronbach α for the scale was $.75$ at baseline and $.89$ at follow-up for daughters and $.73$ at baseline and $.89$ at follow up for mothers. Mothers and daughters reports were correlated ($r = .45$ and $.44$ at baseline and follow-up, respectively, $p < .001$).

2.3.7 Communication about alcohol—At baseline and after the first semester, daughters were asked a series of 30 items, rated on 4-point scales (not at all to a great deal) regarding the extent to which their mothers had discussed specific alcohol-related topics with them. Mothers were asked corresponding questions regarding their alcohol-related communication with their daughters. The mean of these 30 items was used as the measure of alcohol-specific communication. Alpha was $.97$ at baseline and follow-up for both daughter and mother measures. Mothers' and daughters' reports of corresponding measures were correlated ($r = .27$ to $.37$, $p < .001$).

²Mothers also reported on their actual approval of daughters' drinking. At baseline, daughters' ($r = .76$) and mothers' ($r = .67$) reports were correlated at $.47$, $p < .01$, with daughters perceiving mothers as being more approving than mothers say that they are.

2.3.8 Demographics—At baseline, mothers and daughters completed demographic questions regarding ethnicity, age, family composition, parental education and family income. College information, such as living arrangements, was assessed at follow up.

2.4 Data Analysis Plan

As a first step, using one-way analysis of variance (ANOVA) and chi-square tests, the three alcohol permissiveness groups were compared to determine whether they differed on sociodemographic characteristics and parental alcohol-related socialization factors. Next, repeated measures ANOVAs were used to test for changes in alcohol-related variables over the transition from high school to college, including: a) daughters' self-reported frequency of HED; b) mothers' perceptions of the daughters' HED; and c) daughters' perceptions of mothers' alcohol approval. Mother's perception of daughter's alcohol use was included to assess how accurate mothers were at estimating their daughters' alcohol involvement. The permissiveness grouping variable was entered as a factor (three levels), and the interaction between group and time (two levels) was tested to assess whether changes over time differed by permissiveness group. When differences in changes across permissiveness groups were detected, simple effects of time within each group and post-hoc tests were used to identify which groups changed, and to compare the changes between pairs of groups. Tukey's HSD procedure was used to control Type I error in the multiple comparisons of means from the analyses of variance at each time. Effect sizes for the one-way and repeated measures ANOVAs and results were quantified using η^2 (Tabachnick & Fidell, 2007). According to Cohen (1988), η^2 values of .01, .06, and .14 may be interpreted as conventional benchmarks for small, medium, and large effect sizes, respectively. Finally, path analysis, using regression analysis was used to examine whether perceived alcohol approval mediates the relationship between permissiveness and college alcohol use.

3. Results

3.1 Baseline Sociodemographic Differences Among Permissiveness Groups

The three parental permissiveness groups were first compared on baseline sociodemographic characteristics including daughter's age, mother's age, mother's education, mother's marital status, race, family income, and proportion of daughters who had a father in the home. The only significant differences found were for race (daughters: $\chi^2(12) = 25.90$, $p = .01$; mothers: $\chi^2(2) = 6.06$, $p = .05$), family income ($F(2,271) = 3.74$, $p = .03$, $\eta^2 = .03$), and proportion of daughters who had a father in the home ($\chi^2(2) = 11.99$, $p = .002$). The ND group had a higher percentage of Black daughters (6.8%) and Black mothers (9.0%) than the DWM (2.0% Black daughters, 1.5% Black mothers) or DWF groups (1.4% Black daughters, 2.4% Black mothers). The DWM group had a higher mean family income ($M = \$68,867$) than the ND group ($M = \$60,658$). Finally, the daughters in the DWF group were less likely to live with their fathers (73.8%) than were daughters in the ND and DWM groups (89.6% and 88.8%, respectively).

3.2 Differences in Parental Alcohol Socialization Behaviors Among Permissiveness Groups

There were significant differences in baseline parental alcohol-related behaviors observed across the three groups, with the most significant differences observed between the DWF and the ND groups (see Table 1). As predicted, parental alcohol socialization factors that have been previously identified as risk factors for underage drinking were more characteristic of the DWF group than the ND group. Specifically, at baseline, daughters in the DWF group had mothers that drank more per occasion, $F(2, 432) = 3.97$, $p < .02$, were more likely to have seen their mothers intoxicated, $F(2, 462) = 3.40$, $p < .03$, and reported lower rates of general communication (e.g., discussion of daughter's activities) with their mothers than did those who were not permitted to drink at all, $F(2, 465) = 3.49$, $p < .03$. There were no group differences in mother-daughter alcohol-related communication at baseline. The DWM group did not differ

from the other two groups on any of the alcohol socialization factors at baseline, with the exception of daughters' perceptions of mothers' drinking approval, $F(2, 464) = 82.17, p < .001$, with young women in the ND group viewing their mothers as least approving, those in the DWF group seeing their mothers as most approving of their drinking and those in the DWM reporting drinking approval ratings that fell in between the other two groups (See Table 1).

3.3 Baseline Alcohol Use

Eighty percent of the participants had initiated alcohol use prior to the baseline assessment; the average age of first drink was 15 years. Modal drinking frequency was 1–3 times per month, with participants reporting that they consumed 3–4 drinks per drinking occasion. About half of the participants reported no HED in the past 90 days. The three permissiveness groups did not differ on age of drinking initiation. However, as expected, daughters' baseline drinking differed across the three groups, with those in the DWF group reporting significantly more weekend drinking, $F(2, 460) = 25.99, p < .001, \eta^2 = .10$, and higher frequency of HED, $F(2, 462) = 31.09, p < .001, \eta^2 = .12$, as compared to those in the ND and DWM groups (i.e., 1–3 times per month vs. less than once a month). At baseline, the drinking patterns of those in the DWM group were statistically similar to those in the ND group (see Table 2).

3.4 College Alcohol Use

At T1, approximately 80% of the sample reported consuming some alcohol since starting college with a modal drinking frequency of 1–3 times per month and a modal quantity of 3–4 drinks per occasion. Rates of HED increased from baseline, with 67% of the sample reporting HED (consuming at least 4 drinks per occasion) at least once since starting college, and 38% reporting HED in the past two weeks. These rates are comparable to those found in national samples (see Jackson, Sher, & Park, 2005). The three permissiveness groups differed from one another on weekend drinking with those in the ND group drinking significantly less than those in the two groups who had been permitted to drink at home $F(2, 444) = 9.33, p < .001$ (see Table 2).

3.4.1 Does Parental Alcohol Permissiveness Reduce HED in College?—We next examined how drinking changed from high school to college. A repeated measures ANOVA was used to examine the changes in frequency of HED across time by high school drinking permissiveness context³. As expected, there was a significant main effect of time, $F(1, 442) = 29.03, p < .001, \eta^2 = .06$, with all groups increasing the frequency of HED as they transitioned from high school to college. The main effect of permissiveness group was also significant, $F(2, 442) = 26.96, p < .001, \eta^2 = .11$. Consistent with the baseline data, post hoc comparisons indicated that those who were not permitted to drink at all during high school continued to drink the least in college. However, whereas the frequency of HED among those in the DWM group was statistically similar to that of the ND group at baseline, by the end of the first semester in college, the DWM group reported significantly more frequent HED than the ND group. The DWF group continued to report significantly higher rates of HED than the other two groups at the end of the first semester in college (see Table 2).

The interaction between time and permissiveness context was significant $F(2, 442) = 4.25, p < .05, \eta^2 = .02$, indicating that the three groups differed in their change in frequency of HED from high school to college (see Figure 1). Those in the DWF group did not significantly increase their mean frequency of HED over the transition from high school to the first semester

³Maximum number of drinks consumed and weekend drinking in the past 90 days were also assessed as measures of alcohol consumption. Correlations among daughters' measures of frequency of HED, maximum drinks per occasion, and weekend drinking in the past 90 days ranged from .81 – .85 at baseline and from .82 – .83 at follow-up (all p 's < .01). Analyses were run using each of these alcohol variables as outcomes with nearly identical results. For ease of presentation, only analyses pertaining to frequency of HED are presented here.

of college (mean increase = .049, SE = .12, $p = .68$), since their drinking levels were already high and remained high. However, the mean frequency of HED increased significantly for those in the DWM (mean increase $M = .500$, SE = .10, $p < .001$) and the ND groups (mean increase $M = .354$, SE = .06, $p < .001$), as they transitioned to college. Post hoc tests showed that the mean increase for the DWM group was not significantly greater than the mean increase for the ND group. When compared to the mean increase for the DWF group, the increase for the DWM group ($M = .500$) was significantly greater ($M = .049$, $p = .01$) but the mean increase for the ND group ($M = .354$) was not. A separate repeated measures ANOVA examining changes in frequency of HED from the fall semester to the spring semester in college showed no significant time effect and no significant time by permissiveness interaction, indicating that HED remained stable from fall to spring semester over the first year of college.

3.5 Mothers' Perceptions of Daughters' HED Over Time

We repeated the above repeated measures ANOVA using mothers' reports of their perceptions of daughters' HED at baseline and follow-up as the outcome variables. Mothers' and daughters' reports of daughters' HED were moderately correlated in high school ($r = .59$, $p < .001$) and in college ($r = .47$, $p < .001$). The pattern of mother's perception of daughter's drinking mirrored that of daughter's actual drinking; however, mothers in all groups underestimated the frequency with which their daughters engaged in HED both in high school and in college. A visual inspection of the mothers' means (plotted in Figure 2) compared to daughters' shows that mothers of the DWF group reported that their daughters engaged in HED more frequently than did the mothers of the daughters in the ND and DWM groups, in high school $F(2, 281) = 18.53$, $p < .001$, $\eta^2 = .12$ and in the first semester of college ($F(2, 297) = 11.91$, $p < .001$, $\eta^2 = .07$). Repeated measures analysis revealed that there was a significant main effect for time, with mothers from all permissiveness groups on average perceiving that their daughters increased their mean frequency of HED as they transitioned to college, $F(1, 183) = 52.49$, $p < .001$, $\eta^2 = .22$. The main effect of permissiveness group was also significant $F(2, 183) = 12.13$, $p < .001$, $\eta^2 = .12$. Unlike the previous analysis using daughters' actual drinking reports, there was no time by permissiveness interaction. A visual comparison of the patterns of the daughters' reports (Fig. 1) and the mothers' perceptions (Fig. 2) shows that mothers who permitted their daughters to drink with family meals believed that their daughters' frequency of HED remained relatively low, when in fact, the daughters' data indicated that this group increased their HED significantly.

3.6 Does Perceived Approval of Drinking in High School Mediate the Relationship Between Drinking Permissiveness and Subsequent College Drinking?

Because permissiveness can be construed as an indicator of alcohol approval, and previous research indicates that perceived parental alcohol approval is associated with greater alcohol use among adolescents (Abar et al., 2009; Martino et al., 2009, Wood et al., 2004), we speculated that the relationship between parental drinking permissiveness and subsequent college HED may be mediated via perceived parental approval of alcohol use. To test the hypothesized model of the direct and indirect effects of parental permissiveness and perceived parental drinking approval on frequency of college binge drinking, we conducted path analyses, using regression to test the paths. We represented the three-category measure of permissiveness at baseline (TO) with two dummy variables corresponding to the two groups DWM and DWF, with the ND group as the omitted reference category (see Figure 3). The average number of weekly drinks consumed by mothers was used as a covariate in all models to control for mother's drinking. Unstandardized coefficients are shown since they are used in estimating the indirect effects.

First, the total effects model is run without the hypothesized mediator, then, the mediator is added. The total effects model indicated that when compared to those who were not permitted

to drink at home (T0), there was a direct effect of DWF ($\beta = .60, p < .001$) and mother's average number of drinks ($\beta = .36, p < .001$) on daughter's first semester college HED (T1). There was no significant direct effect for DWM. Results for the mediated model are shown in Figure 3. In the mediated model, when compared to those not permitted to drink at home at T0, there is a significant indirect effect of DWM, via daughter's perception of the mother's drinking approval, on the daughter's frequency of HED at T1 (Sobel test, $z = 2.88, p = .004$). Likewise, there was an indirect effect of DWF on T1 HED, via perceived mother's drinking (Sobel test $z = 3.36, p = .001$). Thus, as hypothesized, perceived mother's drinking approval appeared to be the mechanism by which alcohol permissiveness influenced college drinking. The analysis was repeated using second semester college HED drinking data as an outcome variable with first semester perceived drinking approval as a mediator, with nearly identical results, suggesting that the effect of high school drinking permissiveness on college HED, as mediated through perceived mothers' drinking approval is stable over the first year of college.

4. Discussion

Contrary to popular belief, permitting young women to drink at home during high school, in any context, does not appear to be an effective strategy for reducing later heavy drinking in college. Young women who were not permitted to drink alcohol at all during high school consistently reported the least frequent HED at baseline and college assessments, whereas those allowed to drink at home with meals are particularly likely to escalate their drinking as they enter the college environment, which is characterized by fewer institutional controls and more pervasive drinking by peers. Thus, rather than support the notion that parents are preventing HED by permitting drinking in the home, these findings directly refute this common belief.

At baseline, the current study revealed a pattern of alcohol use that was similar to that found by Foley et al. (2004); that is, permitting drinking at home with meals was associated with drinking behaviors that were similar to those not permitted to drink at all and were significantly lower than those permitted to drink with friends. However, with the transition to college, the DWM group was at risk of escalating their drinking so they engaged in significantly more HED than those who were not permitted to drink at all. The discrepancy between the findings of Foley et al. and the current study may reflect changes in drinking behavior over time, since the Foley et al. study was cross-sectional and the current data were collected prospectively. The findings of the current study are consistent with the longitudinal results obtained by van der Vorst et al., (2010) who found that while adolescents permitted to drink at home with parents may not initially drink heavily, their alcohol consumption both inside and outside of the home increases significantly over time.

Perception of parental alcohol approval is one mechanism through which parental permissiveness affects college HED. Results of this study suggest that permitting teens to drink at home, even at family meals, results in teens perceiving greater parental approval of drinking. In turn, consistent with prior research (e.g., Abar et al., 2009; Martino et al., 2009; Wood et al 2004), perceived parental alcohol approval serves to drive, or at least fails to deter, later college drinking. Parents who provide alcohol at home with a meal may believe that they are conveying approval of only moderate drinking, but their daughter may generalize this approval to other contexts, such as college parties, where drinking norms may be higher.

Consistent with prior research (e.g., Guilamo-Ramos et al., 2006), mothers in this study underestimated their daughters' alcohol use in both high school and in the first semester of college. In particular, mothers who allowed their daughters to drink with meals believed that their daughters maintained low levels of HED in college, when their daughters' actual drinking levels escalated significantly. Mothers' failure to recognize the magnitude of the acceleration

of their daughters' college alcohol use may serve to perpetuate the view that allowing teens to drink at home with meals is protective.

4.1 Limitations

Strengths of the study include a large sample size, a longitudinal design, data collected from both mothers and daughters, and a low attrition rate. However, there are several limitations that need to be considered as well. In interpreting the findings of this study, it is important to recognize that parental permissiveness is not randomly assigned; rather, it is one component of a constellation of socialization factors that influence high school and college drinking behaviors. For example, the study also revealed that there were differences in the parental alcohol socialization factors of the different permissiveness groups, with households in which teens were permitted to drink with friends being characterized by greater exposure to parental drinking, less parent-child communication and stronger perceived parental drinking approval--all factors associated with increased risk of drinking among adolescents (e.g., Barnes & Welte, 1986; Martino et al., 2009; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998; Windle, 1999). Given that permissiveness and other socialization factors cannot be randomly assigned, studies such as this one offer our best hope for understanding how they operate to influence underaged drinking.

The apparent effects of permissiveness and drinking approval may be confounded by effects of parental problem drinking. Parents who are heavy or problematic drinkers may be more permissive, more approving of drinking, less vigilant about their adolescents' activities, more tolerant of drinking, and less likely to discuss alcohol use. Although mothers who allowed drinking did drink more themselves, we controlled for this and still found a significant effect for permissiveness. Of course, it is possible that there are other factors that differ across these households, for example, sibling drinking, that we did not control for. Future research also should examine how family constellation and sibling factors relate to parental alcohol permissiveness as it may vary according to the number of children in the family and their ages. For example, having an older sibling that is of legal drinking age may increase the likelihood that a parent will let a younger sibling drink at home. Older siblings can also facilitate teen drinking behavior through provision of alcohol or exposure to an older and heavier drinking peer group (Windle, 2000).

The heavy drinking of those permitted to drink with friends is an important issue to consider. Although the DWF group did not increase their drinking over the transition to college, this should not be construed as evidence that allowing DWF is protective. These young women were already drinking significantly more than the others in high school and early drinking is a risk factor for later alcohol dependence (Hingson, Heeren & Winter, 2006). Allowing drinking with friends may be particularly risky as it promotes teen interaction with heavy drinking peers and peer drinking behavior has reliably emerged as a robust predictor of teen alcohol use (see Windle, 1999; Windle, et al., 2008). Indeed, Livingston and Testa (2007) found that perceived mothers' approval of teen drinking predicted the selection of heavy drinking friends, which in turn predicted teen HED. However, a potential caveat to consider in interpreting these data is that given the late point of baseline assessment (senior year of high school) it is impossible to know the ordering of teen HED and parental alcohol permissiveness. These young women may have already been drinking at high levels before senior year in high school and their parents conceded to letting them drink at home with friends to reduce the risk of further harm (e.g., drinking and driving). Additional longitudinal research tracking teen substance use, household drinking norms, and peer selection at earlier ages is needed to address this question.

Another limitation is that the number of drinks young women were permitted to consume was not assessed. Thus, it is possible that drinking at meals may not be limited to a moderate glass

of wine as many would assume. Also, it is unclear as to whether at-home drinking experiences were coupled with discussions in which parents clearly communicated acceptable drinking limits. Parents may assume they are promoting low-risk drinking by allowing a teen to have a single drink with a meal, but teens may not perceive it as such if parents do not clearly state the limits and parameters for responsible drinking. Future studies on parental permissiveness should address these issues.

Finally, the findings of this study with females cannot be generalized to males because there may be gender differences in critical parameters (e.g., patterns of drinking, drinking norms, mother-adult child communication) not measured and statistically tested in this study. Results are also limited to White females who attend college and are listed in public phone directories; findings need to be replicated with a more representative sample. Addressing these limitations in future studies would serve to further inform discussions about potential changes in social policies (e.g., reducing the minimum legal drinking age) that could have serious ramifications for alcohol-related morbidity and mortality.

4.2 Implications for prevention and research

At the most basic level, parents can help to reduce adolescent HED by not permitting their underage child to drink at home. However, given the complex interaction of social, cultural and motivational factors that influence drinking behavior, we acknowledge that this act alone is likely to be insufficient for preventing college HED. More prospective research is needed to understand the nature of how these factors interact to influence high school and college HED.

Results of the current study have implications for alcohol-related policies. For example, the recently launched Amethyst Initiative calls for a re-examination of the 21 year-old legal drinking age and college alcohol-related policies in an effort to reduce college HED. The members of this Initiative maintain that the current minimal legal drinking (MLDA) of 21 creates a “culture of dangerous, clandestine, binge-drinking,” whereby students drink illicitly off-campus, placing themselves outside of the regulation and protection of the College or University (Amethyst Initiative, 2008). As a remedy, the initiative proposes that the MLDA be lowered, with the rationale that social institutions like families and schools could play a more central role in promoting and enforcing low-risk drinking among teens, thereby reducing the likelihood of binge drinking and its associated consequences in college. Although more research is needed, the results of this study and those of van der Vorst et al., (2010) suggest that this policy change would be unlikely to reduce college HED.

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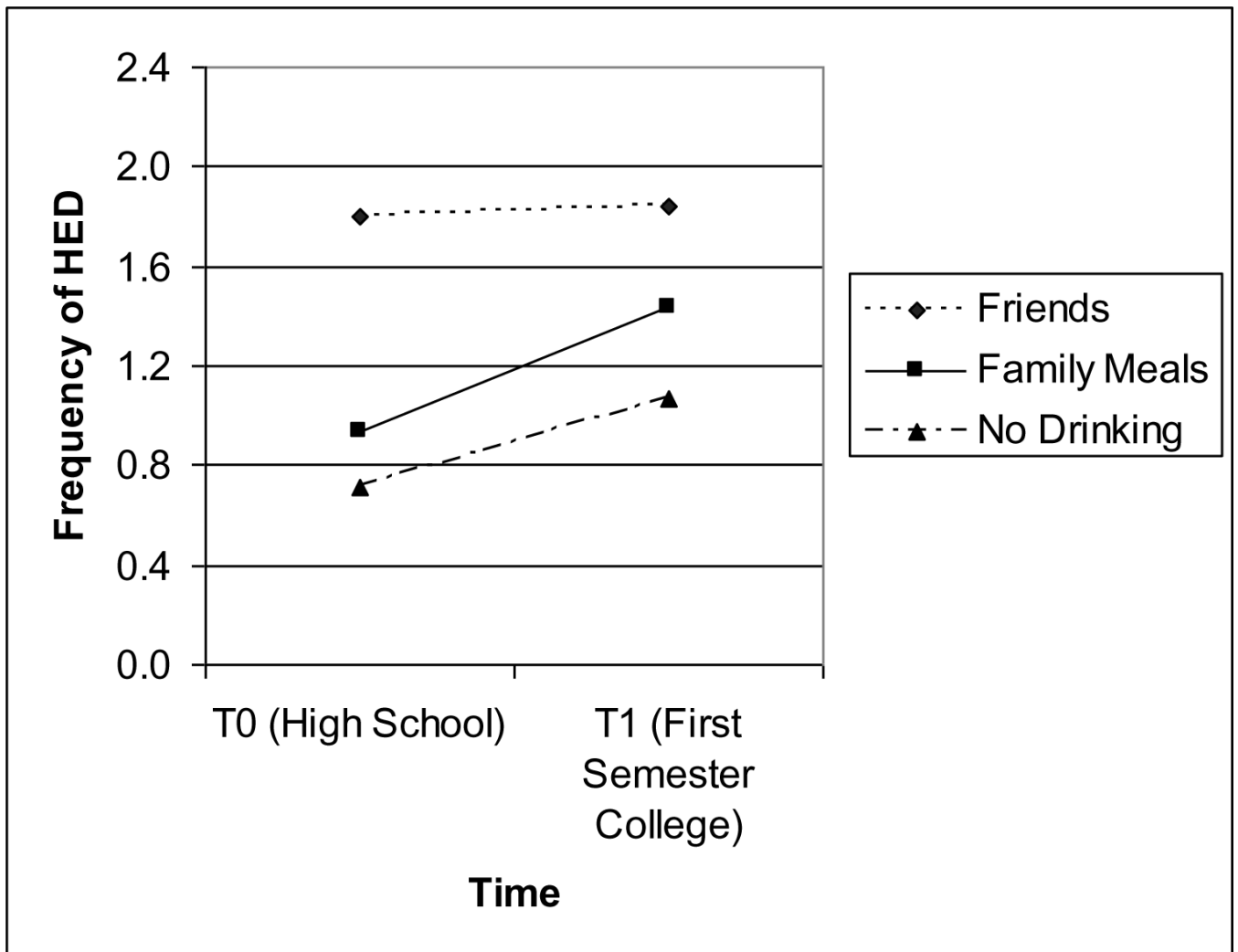


Figure 1. Daughter's report of frequency of HED in high school and first semester of college by permissiveness group.

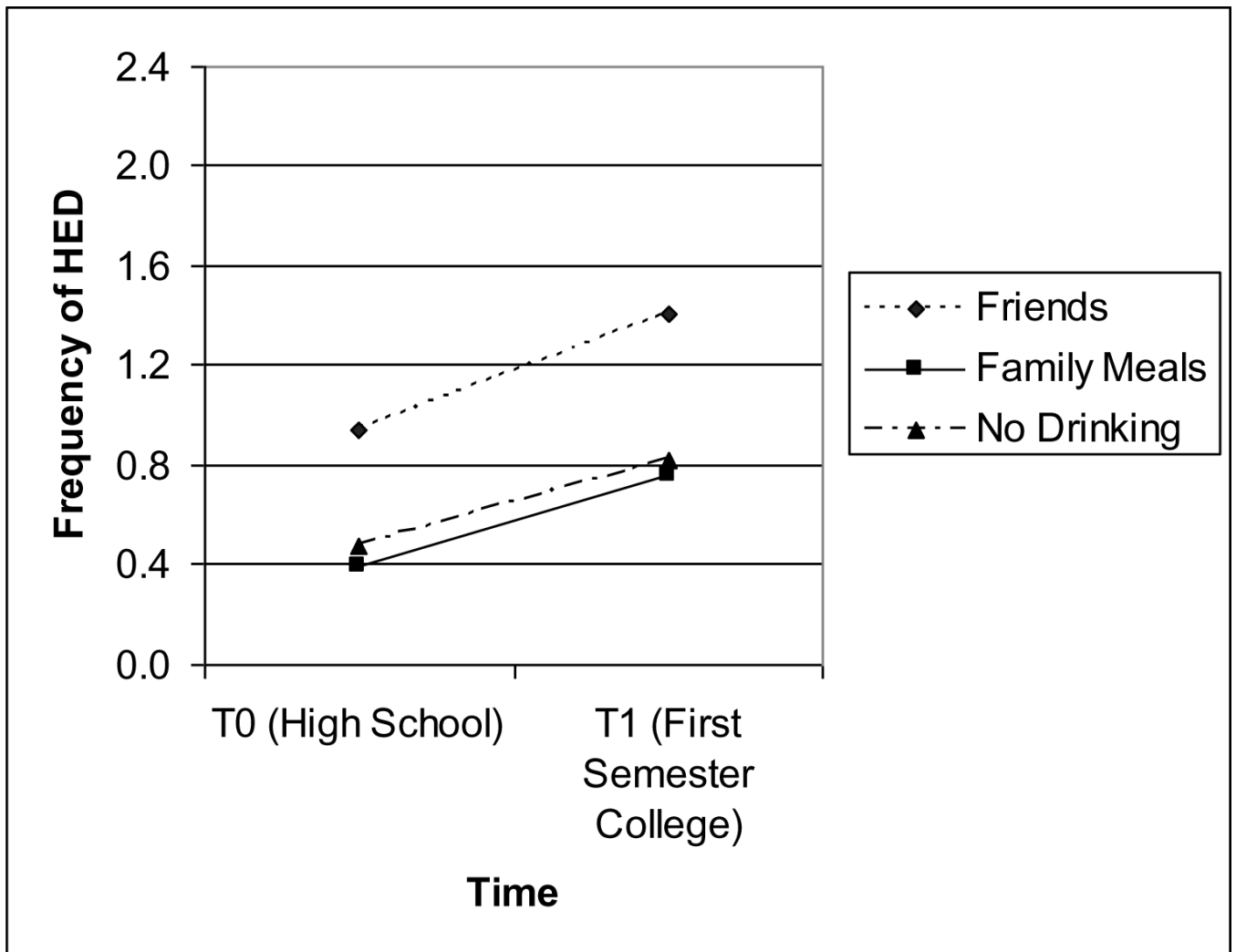
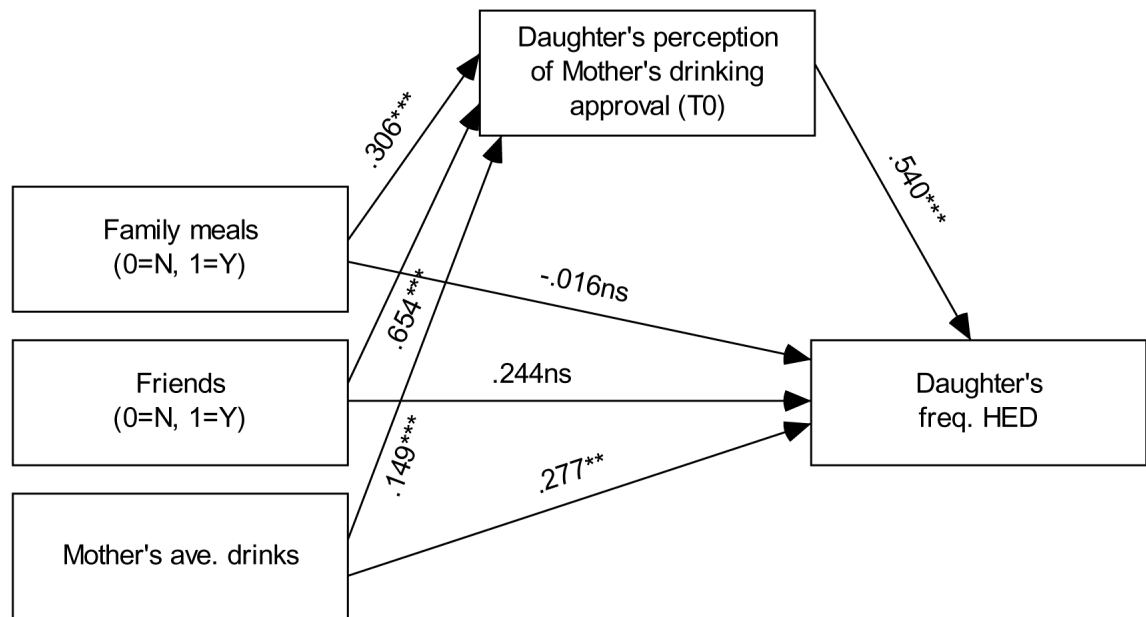


Figure 2. Mother's perceptions of daughters' frequency of HED in high school and first semester of college by permissiveness group.

Senior Year in High School (T0)

First semester in college (T1)

**Figure 3.**

Mediation model for 3-group measure of parental permissiveness for T0 to T1. The reference category is those not permitted to drink at home. Unstandardized coefficients are presented. $N = 271$. ns = not significant at $p < .05$. $*p < .05$. $**p < .01$. $***p < .001$.

Table 1

Comparison of Permissiveness Groups on Baseline Alcohol Socialization Variables

	Parents' Permissiveness for Daughter's Drinking At Home (High School)			
	No Drinking (n = 295)	Family Meals (n = 101)	Friends (n = 72)	η^2
	M (SD)	M (SD)	M(SD)	
Mother's Alcohol Use (90 days)				
Mother's average number of drinks per occasion	0.88 _a (.71)	1.00 _a (.62)	1.14 _b (.68)	.02
Mother's frequency of HED	0.45 (.74)	0.47 (.77)	0.62 (.68)	<.01
Daughter saw mother Intoxicated	1.49 _a (.73)	1.59 _{a,b} (.65)	1.73 _b (.72)	.02
Alcohol Socialization Factors				
General communication (i.e., monitoring)	4.25 _a (.68)	4.26 _{a, b} (.54)	4.03 _b (.74)	.02
Average number of alcohol topics discussed with daughter	2.25 (.82)	2.18 (.73)	2.17 (.56)	<.01
Perceived mother's approval of drinking	1.51 _a (.46)	1.83 _b (.40)	2.26 _c (.50)	.26

Note. Means in each row sharing a common subscript are not statistically different at $p = .05$. according to the Tukey HSD procedure. HED: heavy episodic drinking.

Table 2

Comparison of Daughter's Alcohol Use in High School and College, by Permissiveness Group

	Parents' Permissiveness for Daughter's Drinking At Home (High School)			η^2
	No Drinking (n = 295)	Family Meals (n = 101)	Friends (n = 72)	
	M (SD)	M (SD)	M(SD)	
Daughter's High School Alcohol Use (baseline)				
Weekend drinking	2.52 _a (3.86)	3.51 _a (4.65)	6.56 _b (5.09)	.10
Frequency of HED	0.71 _a (1.00)	0.94 _a (1.01)	1.77 _b (1.15)	.12
Daughter's College Alcohol Use				
Weekend drinking	3.91 _a (4.85)	5.66 _b (5.47)	6.47 _b (5.43)	.04
Frequency of HED	1.06 _a (1.11)	1.42 _b (1.18)	1.85 _c (1.20)	.06

Note. Means in each row sharing a common subscript are not statistically different at $p = .05$, according to the Tukey HSD procedure. HED: heavy episodic drinking.