

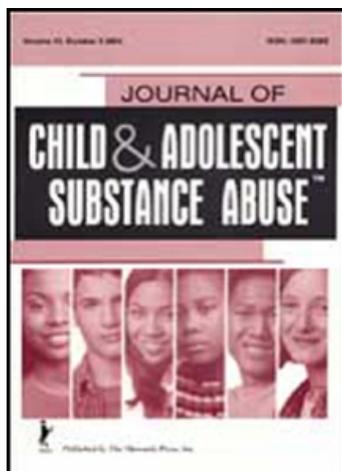
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Joseph LaBrie<sup>a</sup>; Toby Lamb<sup>a</sup>; Eric Pedersen<sup>a</sup>

<sup>a</sup>Loyola Marymount University, Los Angeles, CA, USA

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# Changes in Drinking Patterns Across the Transition to College Among First-Year College Males

JOSEPH LABRIE, TOBY LAMB, and ERIC PEDERSEN

*Loyola Marymount University, Los Angeles, CA, USA*

*Few studies examine changes in drinking behavior during the transition from high school to college. Using a sample of 239 first-year males, we hypothesized that participants would increase drinking from pre-college to the first month of college. Results reveal a general trend toward increased drinking upon entering college. Caucasians increased drinking more than non-Caucasians. Social expectancies of alcohol moderated increases in drinking behavior. These findings indicate that differential changes in drinking behavior occur among incoming college males. Interventions with college students need to address both preventing heavy consumption and alcohol-related problems in pre-college light drinkers and in reducing these behaviors among pre-college heavy drinkers.*

**KEYWORDS** *alcohol, binge drinking, college, expectancies, transition*

## INTRODUCTION

Alcohol use and abuse among college students is a major concern among college administrators. Nationally, 80 to 90% of all underage college students drink (Haines & Spear, 1996). In 1999, the Harvard School of Public Health College Alcohol Study reported that national levels of collegiate binge

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Address correspondence to Joseph LaBrie, PhD, Department of Psychology, Loyola Marymount University, 1 LMU Drive, Suite 4700, Los Angeles, CA 90045, USA. E-mail: jlabrie@lmu.edu

drinking (i.e., drinking five or more drinks for men and four or more for women in a two-hour period) remained fairly constant through the 1990s at about 44% (Wechsler, Lee, Kuo, & Lee, 2000). In addition, college students appear to drink at slightly higher rates than their non-college peers, having a greater annual and monthly prevalence of alcohol use, and a greater two-week prevalence of binge drinking (Johnston, O'Malley, & Bachman, 2001). Contrary to their non-college counterparts, college students also show an escalation in binge drinking during college years, which does not decline until after graduation (Schulenberg & Maggs, 2002). This prolonged duration of potential excessive drinking compounds the risk for developing alcohol use/abuse issues and can negatively impact campus life.

Individuals who engage in frequent binge drinking have a high likelihood of experiencing negative alcohol-related consequences (Wechsler & Nelson, 2001). Almost 5% of all college students encounter police or public safety officers due to misconduct after drinking, while nearly 11% of students admit to vandalizing property after drinking (Wechsler et al., 2002). Furthermore, 2.1 million students drive under the influence of alcohol each year (Hingson, Heeren, & Levenson, 2002). In 2002, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) estimated that each year drinking is involved in 70,000 cases of sexual assault or date rape, 500,000 nonfatal injuries, 400,000 unprotected sex events, and 600,000 assaults of other students (NIAAA, 2002). In addition, one-quarter of all students report a negative impact on their academic work, including missed classes, poor work, and falling behind in course work, as a result of their drinking (Engs, Diebold, & Hanson, 1996; Wechsler et al., 2000; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

### Characteristics Present During College Transition

Schulenberg and colleagues (2001) state that the transition from high school to college can be stressful and that it is characterized as a "developmental disturbance" in that it "reflects developmentally limited deviance that is statistically normative, culturally sanctioned, and time prescribed" (p. 474). This developmental disturbance presents a very wide range of academic, social, and developmental challenges. These challenges make demands on the individual for adaptive responses that may have long-term consequences for future vocational, emotional, and physical health. For example, undergraduates are experiencing higher levels of stress than ever before; record numbers of students are reporting feeling overwhelmed and depressed as well as record-low ratings on physical and emotional well-being (Astin, Korn, Sax, & Mahoney, 1994). For some individuals, overwhelming stress is implicated in the adoption of negative (passive, avoidant, or even self-destructive) coping strategies. Therefore, for some "collegiate problem drinkers, alcohol abuse may represent maladaptive efforts at coping with developmental

transitions rather than the beginnings of future alcoholism” (Berkowitz & Perkins, 1986, pp. 27). This could actually prove to have a paradoxical effect by compounding negative consequences instead of relieving the pressures formed by first-year students’ undertakings. After all, several central tasks must be navigated during this time, such as separation/individuation from family of origin; acquisition of independent living skills; questions of identity formation; demands of academics; and the formation of new social networks (Schulenberg, Maggs, & Hurrelmann, 1997).

The implications of maladaptive coping during this “developmental disturbance” are further intensified when combined with a greater understanding of the importance of the early transition. The NIAAA noted that the first six weeks on campus are critical to first-year student success (NIAAA, 2002). They reported that drinking patterns formed in the first weeks of college tend to persist throughout a student’s collegiate career. Many students initiate heavy drinking during these early days of college, which interferes with their successful adaptation to campus life (Schulenberg et al., 2001). Further, a large body of empirical evidence demonstrates that the freshman year experience is pivotal in determining overall undergraduate success (Noel, Levitz, & Saluri, 1986).

Although the prevalence of alcohol use and abuse among college students is well-researched, few studies have measured the change in drinking behavior during the transition from high school to college. Two studies (Baer, Kivlahan, & Marlatt, 1995; Duchnick, 2004) found large increases in quantity and frequency of drinking from high school to college, but moderators of these increases were not examined. Studies examining pre-college factors (Reifman & Watson, 2003; Weitzman, Nelson, & Wechsler, 2003) found that social reasons for drinking predicted binge drinking during college more so than pre-college binge drinking.

The present study examines changes in drinking behavior during the transition to college among first-year males. College males are targeted because they have been shown to drink at higher levels than their female counterparts (Wechsler et al., 2002) and first-year males have been labeled a specific “high-risk” group by the NIAAA (2002). We hypothesized that participants would experience an increase in several drinking variables from pre-college to the first month of college. We further hypothesized that changes in drinking behavior over the transition to college would be moderated by racial background, previous drinking behavior, measures of well-being/health, and personal alcohol expectancies.

## METHOD

### Participants

At the end of the first month of two sequential academic years, 239 first-year male students (120 during Year 1, 119 during Year 2) at a private university

responded to leaflets requesting participation in a discussion of drinking behavior and campus attitudes toward drinking. The participants were part of a broader NIAAA targeted intervention with first-year male college students (LaBrie, Pedersen, Lamb, & Bove, 2006; LaBrie, Pedersen, Lamb, & Quinlan, 2007). The students received a nominal stipend (\$10) for their participation in the initial assessment (which consisted of an initial questionnaire and a Timeline Followback) and received further remuneration if they participated in the intervention and three months' worth of follow-up. Participants averaged 18.05 years of age ( $SD = 0.49$ ). The ethnic composition of the participants was 61% Caucasian, 11% Hispanic, 5% African American, 6% Asian, and 17% "mixed race" or "other." This ethnic makeup was representative of the overall incoming male students during both years of the study.

### Procedure and Measures

In groups of 10 to 15, participants signed local institutional review board (IRB)-approved consent forms and completed an initial assessment questionnaire that collected demographic information and drinking behavior data for the past 30 days (drinking days per month, average drinks per occasion, and maximum drinks consumed at one time). The questionnaire included several established measures, including the following:

#### RUTGERS ALCOHOL PROBLEM INDEX (RAPI)

The RAPI (White & Labouvie, 1989) assessed problems in the past 30 days related to drinking in young adults using a 23-item questionnaire. Each item asks participants to indicate, over the past month, the approximate number of times (scale from 0 to 4 for each item: "Never," "1-2 times," "3-5 times," "6-10 times," "More than 10 times") each event happened either due to drinking behavior or during drinking activity. Summing the frequency scores of all 23 items in the scale produces a composite score on the measure.

#### GENERAL WELL-BEING

Two rulers from the General Well-Being Schedule (Dupuy, 1978) measured subjective levels of concern for health (General Health Ruler) and experience of tension (Relaxed/Tense Ruler). Participants rated themselves on each ruler from 0–10 indicating how they had generally felt during the previous month.

#### ALCOHOL EXPECTANCIES

The Social and Physical Pleasure (SPP) and Social Enhancement (SE) expectancy factors of the revised Alcohol Expectancies Questionnaire (AEQ-3; George, Frone, & Cooper, 1995) measured participants' beliefs regarding

the social effects of alcohol. Both factors contain five items ranked on a seven-point Likert scale, ranging from “strongly disagree (1)” to “strongly agree (7).” Each factor score is derived from the average of its five items and both factors have well-established statistical properties (Brown, 1985; Goldman, Greenbaum, & Darkes, 1997).

#### TIMELINE FOLLOWBACK

Participants individually completed a Timeline Followback (TLFB; Sobell & Sobell, 1992) assessment administered in a group setting. Although the TLFB is usually administered individually, this group format has been shown to provide comparable estimates of previous drinking behavior to validated individual TLFBs (LaBrie, Pedersen, & Earleywine, 2005; Pedersen & LaBrie, 2006). Participants received a calendar of the previous three months that highlighted important academic and national holidays, as well as important campus-specific dates. In order to assist memory, each participant identified other personal “marker” days, such as vacations, sporting events, visitors, parties, and birthdays. Next, each participant went back through the calendar day by day for the three months marking drinking events, using marker dates and their established drinking patterns as memory aids. For each day, they marked whether they had consumed alcohol and, if drinking occurred, they noted the number of drinks they consumed that day. The TLFB has displayed adequate reliability with college students (Sobell, Sobell, Klajner, Pavan, & Basian, 1986). The past month of the TLFB was used for the first month of college drinking data, while the month prior to the first day of school was used as pre-college drinking data.

## RESULTS

### Description of Drinking Behavior

Descriptive data detailing the drinking patterns for the entire sample during the first month of college are contained in Table 1. Composite RAPI scores significantly correlated with quantity  $\times$  frequency during the first month of college ( $r = .339, p < .001$ ).

### Change in Drinking Behavior During Transition to College

The drinking behavior for all participants increased slightly during the transition from pre-college to the first month of college (see Table 1). The average drinking days per month increased during the first month of college ( $t(236) = 3.01, p < .01$ ). Similarly, the average drinks per occasion increased although this difference was not significant. The number of binge-drinking episodes increased significantly ( $t(235) = 2.52, p < .05$ ).

**TABLE 1** Changes in Drinking for All Participants (Pre-College Non-Drinkers and Pre-College Drinkers)

	1 Month Pre-college	First month of college
All participants ( <i>n</i> = 239)	Mean (SD)	Mean (SD)
Drinking days	4.00 (5.35)	4.96 (5.11)**
Average drinks	4.81 (4.44)	5.26 (3.72)
Quantity x frequency	29.87 (50.67)	34.63 (49.62)
Binge-drinking episodes	2.70 (4.18)	3.31 (4.29)*
Pre-college non-drinkers ( <i>n</i> = 88)		
Drinking days	—	1.95 (2.98)***
Average drinks	—	2.34 (3.25)***
Quantity x frequency	—	11.76 (21.70)***
Binge-drinking episodes	—	1.19 (2.54)***
SE composite score		3.30 (2.85)
SPP composite score		2.85 (1.73)
Pre-college drinkers ( <i>n</i> = 147)		
Drinking days	6.43 (5.53)	6.70 (5.32)
Average drinks	6.76 (3.94)	5.80 (3.64)**
Quantity x frequency	47.76 (57.05)	48.32 (56.23)
Binge-drinking episodes	4.32 (4.59)	4.57 (4.63)
SE composite score		4.89 (1.62)
SPP composite score		4.91 (1.23)

Note: \*Represents a significant increase from pre-college to first month of college ( $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ). All drinking variables and expectancy variables during equivalent time periods are significantly different between pre-college non-drinkers and pre-college drinkers at  $p < .001$ .

#### NON-DRINKERS AT PRE-COLLEGE

Forty-one of the 88 participants (47%) who did not consume alcohol during the month before college went on to consume alcohol during the first month of college. Pre-college non-drinkers averaged 11.76 (21.70) drinks during their first month at college.

#### DRINKERS AT PRE-COLLEGE

All drinkers during pre-college continued to drink during the first month of college. Pre-college drinkers barely increased drinks per month and drinking days during the first month of college (see Table 2), but significantly decreased average drinks from (6.76 [3.94] to 5.80 [3.64],  $t [146] = 2.86$ ,  $p < .01$ ). However, pre-college drinkers drank significantly more than pre-college non-drinkers on all drinking variables assessed (see Table 1).

#### Moderators of Drinking During the Transition to College

Based on median splits, participants were divided into high and low groups for both their scores on the Social Enhancement (SE) and Social and Physical Pleasure (SPP) subscales of the Alcohol Expectancy Questionnaire. Those high in SPP ( $n = 116$ ) experienced greater increases in binge-drinking

**TABLE 2** Caucasians Versus Non-Caucasians for Changes in Drinking Variables

	1 Month Pre-college	First month of college
Caucasian ( <i>n</i> = 146)	Mean (SD)	Mean (SD)
Drinking days	4.61 (5.33)	6.12 (5.37)***
Average drinks	4.81 (4.44)	5.26 (3.72)*
Quantity x frequency	36.14 (55.62)	44.77 (56.26)
Binge-drinking episodes	3.30 (4.48)	4.21 (4.68)**
SE composite score		4.67 (1.73)
SPP composite score		4.43 (1.44)
Non-Caucasian ( <i>n</i> = 93)		
Drinking days	3.02 (5.26)	3.11 (4.05)
Average drinks	3.29 (4.51)	3.31 (3.80)
Quantity x frequency	19.78 (39.70)	18.31 (30.10)
Binge-drinking episodes	1.75 (3.48)	1.86 (3.09)
SE composite score		3.90 (2.17)
SPP composite score		3.93 (2.03)

Note: \*Represents a significant increase from pre-college to first month of college ( $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ ). All drinking variables and expectancy variables during equivalent time periods are significantly different between Caucasians and non-Caucasians at  $p < .05$ .

behavior from pre-college to the first month of college than those who were low in SPP ( $n = 107$ ) (increases of 0.13 (3.49) versus 1.24 (4.08);  $t(218) = 2.17$ ,  $p < .05$ ). Although SE itself did not impact greater increase in binge drinking, those participants who were high in both SE and SPP ( $n = 78$ ) increased binge-drinking behavior significantly more than those participants who were low in both SE and SPP ( $n = 80$ ) (increases of 1.42 (3.93) versus 0.13 (3.05);  $t(155) = 2.29$ ,  $p < .05$ ). In addition, those high in both SE and SPP significantly increased drinking days from 6.06 (5.69) to 7.76 (5.44) days per month ( $t(78) = 2.97$ ,  $p < .01$ ), quantity x frequency from 42.94 (54.94) to 55.21 (54.24) drinks per month ( $t(77) = 2.48$ ,  $p < .05$ ), and binge-drinking occasions from 4.00 (4.58) to 5.42 (4.70) times per month ( $t(78) = 3.21$ ,  $p < .01$ ).

Mean scores on SE and SPP variables for pre-college drinkers and non-drinkers are displayed in Table 1. Pre-college drinkers tended to be high in both SE and SPP (46%), with only 16% of pre-college non-drinkers high in both SE and SPP ( $X^2(1, 232) = 25.37$ ,  $p < .001$ ). Sixty-three percent of pre-college non-drinkers were low in both SE and SPP, while 22% of pre-college drinkers were low in both SE and SPP ( $X^2(1, 232) = 32.75$ ,  $p < .001$ ). For pre-college non-drinkers, total drinks during the first month of college correlated with both SE ( $r = .463$ ,  $p < .001$ ) and SPP ( $r = .514$ ,  $p < .001$ ), while only SPP correlated with total drinks for pre-college drinkers ( $r = .200$ ,  $p < .05$ ). A linear regression revealed that SPP (but not SE) mediated the increases in drinks per month for pre-college non-drinkers ( $\beta = 6.86$ ;  $R^2 = .264$ ,  $t(72) = 5.05$ ,  $p < .001$ ). This relationship was not evident for pre-college drinkers.

The General Health Ruler, a global measure of concern over one's health, was found to be associated with increases in quantity x frequency ( $r = .147$ ,  $p < .05$ ), increases in drinking days ( $r = .159$ ,  $p < .05$ ), and differences

in the number of binge-drinking episodes ( $r = .137, p < .05$ ) from pre-college to the first month of college. The more students felt concerned about their overall health, the more they drank across the transition from pre-college to the first month of college. The tension/relaxed ruler did not correlate with changes in drinking behavior.

### Alcohol-Related Consequences

For alcohol-related problems, participants were divided into three groups based on composite RAPI scores. The low group ( $n = 81$ ) experienced no alcohol-related problems in the previous month with a score of zero, the medium group ( $n = 77$ ) ranged in composite scores from one to five, and the high group ( $n = 80$ ) ranged in scores from six to 35 (median = 10). Although we found no differences between groups in changes from pre-college to the first month of college, a paired samples *t*-test revealed those high in composite RAPI scores at the first month of college increased drinking days from 5.37 (5.97) to 7.08 (5.52) ( $t(77) = 2.90, p < .01$ ). A significant difference existed between the high group and the low group on this variable ( $t(157) = 2.61, p < .05$ ). Finally, those participants who increased alcohol use during the first month at college experienced higher composite RAPI scores ( $n = 125; 5.36 (6.08)$ ) than those participants who drank similar amounts during pre-college and the first month at college ( $n = 49; 2.37 (5.36); t(171) = 3.15, p < .01$ ).

Participants were again divided into two groups: (1) those that did not increase drinking across the transition and those who increased up to 25 drinks per month and (2) those that increased drinks per month by more than 25 drinks during the first month of college. Those who increased more than 25 drinks had significantly higher composite RAPI scores than those participants who did not increase or increased 25 drinks or less (6.68 (5.98) versus 3.71 (5.51);  $t(171) = 3.08, p < .01$ ). Those who increased more than 25 drinks also had significantly higher scores on both SE (5.09 (1.51) versus 3.85 (2.17),  $t(156) = 3.61, p < .001$ ) and SPP (4.85 (0.95) versus 3.61 (1.86),  $t(157) = 4.37, p < .001$ ).

Finally, independent samples *t*-tests compared pre-college non-drinkers to pre-college drinkers on composite RAPI scores in the past month. Pre-college drinkers had significantly higher composite RAPI scores than pre-college non-drinkers during the first month of college (5.86 (6.79) versus 2.66 (4.22),  $t(232) = 3.98, p < .001$ ). However, a linear regression analysis revealed that changes in quantity  $\times$  frequency from pre-college to the first month of college significantly predicted composite RAPI scores for pre-college non-drinkers only ( $\beta = .062; R^2 = .103, t(87) = 3.14, p < .01$ ). Finally, during the first month of college, composite RAPI scores significantly correlated with SE scores ( $r = .224, p < .01$ ) and SPP scores ( $r = .178, p < .05$ ) for pre-college drinkers only.

## High-Risk Drinkers

Reports indicate that 21 drinks per week is considered the maximum safe consumption limit for males in terms of avoiding development of acute and chronic health problems (Engs & Aldo-Benson, 1995; Cohen, Tyrell, Russell, Jarvis, & Smith, 1993). Prior to college, 25 participants drank more than the weekly maximum safe consumption level (calculated by monthly drinking quantity  $\times$  frequency  $\geq 84$  drinks). During the first month of college, 12 of these high-risk drinkers (48%) decreased drinking to less than 21 drinks per week, while 10 participants (4%) who drank less than 21 drinks per week prior to college increased to 21 or more drinks per week during the first week of college. Participants who drank 21 or more drinks per month at pre-college reduced quantity  $\times$  frequency during the first month of school by 24%, from 149.88 (66.36) drinks per month to 113.56 (94.45) drinks per month ( $t(24) = 2.13, p < .05$ ). While still drinking at high levels (mean average drinks per occasion = 9.61 (3.50)), those participants who drank more than 21 drinks per week prior to college had significantly higher composite RAPI scores during the first month of college than those who drank less than 21 drinks per week at pre-college (9.42 (7.44) versus 4.11 (5.75),  $t(232) = 4.15, p < .001$ ).

Frequency statistics of individual average drinks during the month prior to college revealed that 40% of participants averaged five or more drinks per occasion (binge drinking). Over the transition, these participants reduced mean average drinks from 8.92 (3.31) to 6.87 (3.72) ( $t(92) = 4.57, p < .001$ ) while those who averaged less than 5 drinks per occasion increased mean average drinks from 1.15 (1.65) to 2.96 (3.13) ( $t(141) = 6.89, p < .001$ ). During the first month of college, 45% of participants were averaging five or more drinks per occasion. Finally, during the first month of college those who averaged five or more drinks prior to college had significantly higher RAPI scores than those who drank less than five drinks before college (7.10 (7.51) versus 3.07 (4.42),  $t(232) = 5.16, p < .001$ ).

## Ethnic Differences

Examination of participant demographic variables revealed that race was related to changes in drinking behavior from pre-college to the first month of college. Caucasian participants ( $n = 146$ ) significantly increased drinking across the transition to college, while non-Caucasian participants ( $n = 93$ ) did not (see Table 2). In addition, 59% of Caucasian participants who did not drink at pre-college began drinking during the first month at college while 34% of non-Caucasian participants who did not drink at pre-college began drinking at the first month at college ( $X^2(N = 239, df = 1) = 12.56, p < .01$ ). Furthermore, we found no differences in composite RAPI scores between Caucasians and non-Caucasians who increased their drinking from

pre-college to the first month of college (Caucasians, 5.34 (6.31) versus non-Caucasians, 5.40 (5.57),  $p = .960$ ). Finally, for Caucasian participants significant correlations existed between composite RAPI scores and SE ( $r = .255$ ,  $p < .01$ ), as well as RAPI scores and SPP ( $r = .358$ ,  $p < .001$ ). For non-Caucasian participants, significant correlations existed between composite RAPI scores and SE ( $r = .288$ ,  $p < .01$ ), but not between RAPI scores and SPP ( $r = .172$ ,  $p = .116$ ). A Fisher's R to Z transformation revealed no significant difference between ethnicities and correlations for both the RAPI and SE and the RAPI and SPP. Although more Caucasian participants tended to be high in both SE and SPP more so than non-Caucasian participants (42% versus 26%), and non-Caucasian participants tended to be both low in SE and SPP more so than Caucasian participants (45% versus 29%), chi-square analyses revealed no difference between the two groups of participants on the two variables.

## DISCUSSION

The present study examined drinking over the transition period from pre-college to college for first-year males by utilizing a retrospective three-month Timeline Followback. While there appears to be a general trend toward increased drinking upon entering college, several factors influence these results. First, lighter drinkers at pre-college and those who did not drink prior to college appear to increase drinking across the transition, albeit to levels of consumption lower than heavy drinkers at pre-college. Pre-college drinkers did not significantly increase drinking days or drinks per month, and decreased average drinks consumed per occasion. Although not increasing drinking, pre-college drinkers may be prone to experience alcohol-related problems during the first month of college due to heavy consumption levels continued from pre-college to the first month of college. Finally, Caucasian participants increased drinking across the transition, while non-Caucasian participants did not. These findings indicate that differential changes in drinking behavior occur among incoming college males, but underscore the complexity of the transition to college and its impact on drinking patterns that potentially may last throughout college. The current findings reveal that drinking prior to college and continuing at pre-college levels may be just as risky as increasing drinking behavior during college.

Those students who drank before college did not significantly increase their drinking; in fact, they reduced the average number of drinks they consumed per occasion. This was even more apparent for heavier drinkers (those who drank more than 21 drinks per week or who averaged five or more drinks per occasion). It appears that students who have had little or no contact with alcohol prior to college are most at risk for large increases in drinking behavior, as any drinking represents an increase in behavior.

Consistent with previous research that suggests those who begin drinking before college are at increased risk for alcohol-related problems in college (Gruber, DiClemente, Anderson, & Lodico, 1996; Harford, Wechsler, and Muthen, 2002), pre-college non-drinkers in the current sample had significantly lower alcohol-related problems during the first month at college than pre-college drinkers. However, increases in quantity x frequency from pre-college to college significantly predicted alcohol-related problems only for pre-college non-drinkers. Therefore, both pre-college non-drinkers and pre-college drinkers are at risk for the development of or the continuation of high consumption levels and associated negative consequences during the first month of college.

Moderators of drinking increases from pre-college to the first month of college include social expectancy effects of alcohol and concern with health. Alcohol expectancies play a significant role in alcohol consumption (Goldman et al., 1997; Stein, Goldman, & Del Boca, 2000), and the current study suggests they play a role in increased drinking at college as well. Those high in social expectancies significantly increased binge-drinking behavior from pre-college to the first month of college. Alcohol expectancies may play a more important role during the "developmental disturbance" (Schulenberg et al., 2001) of transitioning to college because of students' normative concerns regarding the establishment of new social networks. For pre-college non-drinkers, higher social expectancy scores associated with higher alcohol-related problems. Social and physical pleasure expectancy scores also mediated the increase in drinks per month for these pre-college non-drinkers. Participants with greater concern for their own health tended to increase drinking greater than those with lower concern over health.

Ethnic background appears related to significant differences in drinking change variables across the college transition. During the first month of college, Caucasian participants increased drinking days, average drinks per occasion, and binge-drinking episodes. In contrast, non-Caucasians did not experience any differences in drinking from pre-college to the first month of college. While differences in overall consumption rates among Caucasian and racial minorities are well-documented (Presley, Meilman, & Leichter, 2002), no studies have examined ethnic differences in changes in drinking during the transition to college. It is, however, not possible given the present data to understand the reasons for these transitional differences in drinking behavior. Perhaps Caucasians find it easier to attach to social networks (such as fraternities and other campus organizations) where heavier drinking may be more prominent. Alternatively, racial minorities may experience more pressure than their Caucasian counterparts to be successful in college and, thus, do not increase drinking to levels with which they are not experienced. Finally, non-Caucasian participants tended to come from lower-income families than Caucasian students; 47% of Caucasian participants came from

families making \$151,000 or more, while only 19% of non-Caucasian participants came from families making \$151,000 or more. Therefore, they may have had more to lose (e.g., family's college savings, scholarships) than wealthier Caucasian participants. Future research into these differences is necessary to determine possible mediating variables accounting for the observed differences between Caucasians and non-Caucasians.

Limitations exist in the current study. Since the current study was part of a larger intervention targeting first-year males, females were not included in the analyses. The exclusion of females does not allow for a comprehensive understanding of changes in drinking behavior during the transition to college. Considerable research suggests differences in drinking patterns and behavior between male and female college students (Lo, 1995; Wechsler, Molnar, Davenport, & Baer, 1999). Thus, it may be that males and females differ in their drinking behavior during the transition to college. In addition, since the pre-college data are obtained from students' behavior during the summer before college, it is difficult to ascertain whether it truly represents an individual's drinking patterns before college. The label of "pre-college non-drinkers" is based on drinking done over one month of the summer, and may not accurately classify these participants as "non-drinkers" over a longer time period. Finally, all collected drinking data were retrospective and, although the TLFB yields reliable and valid estimates of previous behavior (Sobell & Sobell, 1992; Sobell et al., 1986), we cannot be sure that self-reported drinking data are completely accurate. Future studies utilizing longitudinal data collection measures would provide a more accurate description of changes in drinking during the transition from high school to college.

Despite the stated importance of the first weeks of college in establishing patterns of socialization and drinking (NIAAA, 2002), the first month in college may represent too limited a time period to measure behavioral changes, as students may not yet be stable in their new environment. Examination of drinking patterns at the end of the first semester may represent more stabilized drinking patterns that could further be compared to pre-college drinking. Nonetheless the present report provides important data for actual drinking behavior across the critical months before and during college entrance.

Although the sample was ethnically diverse, we did not have enough participants in each ethnic group to compare ethnicities outside Caucasian and non-Caucasian groups. Future studies examining the transition from pre-college to college beyond Caucasian and non-Caucasian categories that include adequate numbers of Hispanics, Asian-Americans, and African Americans for meaningful comparisons would be helpful. Finally, all data were collected at one private university on the west coast. Additional studies may seek to examine the transition to college at multiple sites to further support our findings.

The current findings suggest that the transition to college and its effects on drinking are complex. Factors such as racial background, previous drinking patterns, alcohol-related social expectations, social opportunities, and general emotional state all may play a role in changes in drinking during the transition to college. However, it is possible to identify certain student characteristics that contribute to a vulnerability to the development of problematic drinking patterns. The development of college alcohol prevention/intervention programs should take into account the differential needs of students in designing and implementing freshman interventions. Although not all students respond to the transition to college life with increased drinking, some are especially predisposed to engage in maladaptive drinking patterns that interfere with the successful adaptation to campus life and the fulfillment of effective educational experiences. Colleges that develop specific and targeted prevention and intervention programs with first-year students could potentially improve retention of first-year male students, promote more responsible drinking, and decrease negative campus events involving alcohol.

## REFERENCES

- Astin, A. W., Korn, W. S., Sax, L. J., & Mahoney, K. M. (1994). *National norms for fall: The American freshman, 1994*. Los Angeles: Higher Education Research Institute. University of California Los Angeles.
- Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1995). High-risk drinking across the transition from high school to college. *Alcoholism: Clinical and Experimental Research*, *19*(1), 54–61.
- Berkowitz, A. D. & Perkins, W. H. (1986). Problem drinking among college students: A review of recent research. *Journal of American College Health*, *35*(1), 21–28.
- Brown, S. A. (1985). Expectancies versus background in the prediction of college drinking patterns. *Journal of Consulting and Clinical Psychology*, *53*(1), 123–130.
- Cohen, S., Tyrell, D. A., Russell, M. A., Jarvis, M. J., & Smith, A. P. (1993). Smoking, alcohol consumption, and susceptibility to the common cold. *American Journal of Public Health*, *82*, 1277–1283.
- Duchnick, J. J. (2004). Changes in alcohol consumption with entrance into college. *Dissertation Abstracts International: Section B: The Sciences & Engineering*, *65*(2-B), 1026.
- Dupuy, H. J. (1978). Self-representations of general psychological well-being of American adults. Paper presented at the American Public Health Association Meeting, Los Angeles, CA.
- Engs, R. C. & Aldo-Benson, M. (1995). The association of alcohol consumption with self-reported illness in university students. *Psychological Reports*, *74*, 12–14.
- Engs, R. C., Diebold, B. A., & Hanson, D. J. (1996). The drinking patterns and problems of a national sample of college students, 1994. *Journal of Alcohol and Drug Education*, *41*(3), 13–33.

- George, W. H., Frone, M. R., & Cooper, M. L. (1995). A revised Alcohol Expectancy Questionnaire: Factor structure confirmation and invariance in a general population sample. *Journal of Studies on Alcohol*, *56*(2), 177–185.
- Goldman, M. S., Greenbaum, P. E., & Darkes, J. (1997). A confirmatory test of hierarchical expectancy structure and predictive power: Discriminant validation of the Alcohol Expectancy Questionnaire. *Psychological Assessment*, *9*(2), 145–157.
- Gruber, E., DiClemente, R. J., Anderson, M. M., & Lodico, M. (1996). Early onset and its association with alcohol use and problem behavior in late adolescence. *Preventive Medicine*, *25*, 293–300.
- Haines, M. & Spear, S. F. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health*, *45*(3), 134–140.
- Harford, T. C., Wechsler, H., & Muthen, B. O. (2002). The impact of current residence and high school drinking on alcohol problems among college students. *Journal of Studies on Alcohol*, *63*(3), 271–279.
- Hingson, R., Heeren, T., & Levenson, S. (2002). Age of drinking onset, driving after drinking, and involvement in alcohol related motor-vehicle crashes. *Accident Analysis and Prevention*, *34*(1), 85–92.
- Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2001). *Monitoring the future national survey results on drug use, 1975–2000* (Vol. 1: Secondary School Students). Bethesda, MD: National Institute on Drug Abuse.
- LaBrie, J. W., Pedersen, E. R., & Earleywine, M. (2005). A group-administered Timeline Followback assessment of alcohol use. *Journal of Studies on Alcohol*, *66*, 693–697.
- LaBrie, J. W., Pedersen, E., Lamb, T., & Bove, E. (2006). *Heads UP!* A nested intervention with freshmen male college students to promote responsible drinking. *Journal of American College Health*, *54*, 301–304.
- LaBrie, J. W., Pedersen, E. R., Lamb, T., & Quinlan, T. (2007). A campus-based group motivational intervention to reduce problematic drinking in freshmen males. *Addictive Behaviors*, *32*(5), 889–901.
- Lo, C. C. (1995). Gender differences in collegiate alcohol use. *Journal of Drug Issues*, *25*(4), 817–836.
- National Institute on Alcohol Abuse and Alcoholism. (2002). A call to action: Changing the culture of drinking at U.S. colleges (NIH Publication No. 02-5010). Rockville, MD: National Institute on Alcohol and Abuse and Alcoholism.
- Noel, L., Levitz, R., & Saluri, D. (1986). *Increasing student retention*. San Francisco: Jossey Bass.
- Presley, C. A., Meilman, P. W., & Leichliter, J. S. (2002). College factors that influence drinking. *Journal of Studies on Alcohol, Suppl*(14), 82–90.
- Pedersen, E. R. & LaBrie, J. W. (2006). A within-subjects validation of a group administered Timeline Followback for alcohol use. *Journal of Studies on Alcohol*, *67*, 332–335.
- Reifman, A. & Watson, W. K. (2003). Binge drinking during the first semester of college: Continuation and desistance from high school patterns. *Journal of American College Health*, *52*(2), 73–81.

- Schulenberg, J. & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol, 14*, 54–70.
- Schulenberg, J., Maggs, J. L., & Hurrelmann, K. (1997). Negotiating developmental transitions during adolescence and young adulthood: Health risks and opportunities. In J. Schulenberg & J. L. Maggs (Eds.), *Health risks and developmental transitions during adolescence*. New York: Cambridge University Press.
- Schulenberg, J., Maggs, J. L., Long, S. W., Sher, K. J., Gotham, H. J., Baer, J.S., et al. (2001). The problem of college drinking: Insights from a developmental perspective. *Alcoholism: Clinical and Experimental Research, 25*, 473–477.
- Sobell, L. C. & Sobell, M. B. (1992). Timeline Followback: A technique for assessing self-reported alcohol consumption. In R. Z. Litten & J. P. Allen (Eds.), *Measuring alcohol consumption: Psychosocial and biochemical methods*. Totowa, NJ: Humana Press, Inc.
- Sobell, M. B., Sobell, L. C., Klajner, F., Pavan, D., & Basian, E. (1986). The reliability of a timeline method for assessing normal drinker college students' recent drinking history: Utility for alcohol research. *Addictive Behaviors, 11*, 149–162.
- Stein, K. D., Goldman, M. S., & Del Boca, F. K. (2000). The influence of alcohol expectancy priming and mood manipulation on subsequent alcohol consumption. *Journal of Abnormal Psychology, 109*(1), 106–115.
- Wechsler, H., Davenport, A., Dowdall, G. W., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college: A national survey of students at 140 campuses. *Journal of the American Medical Association, 272*, 1672–1677.
- Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. P. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health study surveys, 1993–2001. *Journal of American College Health, 50*, 203–217.
- Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: A continuing problem: Results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health, 48*(5), 199–210.
- Wechsler, H., Molnar, B. E., Davenport, A. E., & Baer, J. S. (1999). College alcohol use: A full or empty glass? *Journal of American College Health, 47*(6), 247–253.
- Wechsler, H. & Nelson, T. F. (2001). Binge drinking and the American college students: What's five drinks? *Psychology of Addictive Behaviors, 15*(4), 287–291.
- Weitzman, E., Nelson, T., & Wechsler, H. (2003). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health, 32*, 26–35.
- White, H. R. & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol, 50*(1), 30–37.