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Academic and Social Motives and Drinking Behavior

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Abstract

This longitudinal study of 1,447 first-time college students tested separate time-varying covariate models of the relations between academic and social motives/behaviors and alcohol use and related problems from senior year of high school through the end of the second year in college. Structural equation models identified small but significant inverse relations between academic motives/behaviors and alcohol use across all time points, with relations of somewhat larger magnitude between academic motives/behaviors and alcohol-related problems across all semesters other than senior year in high school. At all time points, there were much larger positive relations between social motives/behaviors and alcohol use across all semesters, with smaller but significant relations between social motives/behaviors and alcohol-related problems. Multi-group models found considerable consistency in the relations between motives/behaviors and alcohol-related outcomes across gender, race/ethnicity, and family history of alcohol problems, although academic motives/behaviors played a stronger protective role for women, and social motives were a more robust risk factor for Caucasian and Latino students and individuals with a positive family history of alcohol problems. Implications for alcohol prevention efforts among college students are discussed.

Keywords

college students; academic and social motivations; alcohol use; racial/ethnic and gender differences; family history

The transition from high school to college is marked by significant increases in heavy alcohol use (Fromme, Corbin, & Kruse, 2008; Schulenberg and Maggs; 2002; White et al., 2006). This may relate in large part to the new sociocultural context in which students are trying to negotiate powerful and often competing developmental tasks. College students must learn to function independently in a rigorous academic setting, while at the same time, they are developing new social networks that may ultimately provide critical support in successfully negotiating the challenges of college. Thus, the transition from high school to college is characterized by important and often competing motives that are associated with academic and social activities (Arnett, 2006; Pancer, Hunsberger, Pratt, & Asilat, 2000). Alcohol may play an important role in both of these aspects of college life, though the direction of effects may differ (Borsari, Murphey, & Barnett, 2007; White & Jackson,

2004/2005). Whereas heavy drinking may be counter-productive to academic pursuits (Porter & Pryor, 2007; Singleton, 2007), it may facilitate social objectives (LaBrie, Hummer, & Pederson, 2007; Simons, Christopher, Oliver, & Stanage, 2006). The aim of the current study was to examine these competing influences using longitudinal data collected during the early years of college.

The primary goal of college attendance for most students is to obtain a college degree, but there is considerable individual variability in the extent to which students are focused on their academic goals, particularly during the first year of college (Conti, 2000). The extent to which students are academically motivated may well have an influence on behaviors outside the academic arena, including alcohol use (Bryant, Schulenberg, O'Malley, Bachman, & Johnston, 2003; Hawkins, Catalano, & Miller, 1992; Wechsler, Dowdall, Davenport, & Castillo, 1995). For example, Rhoades and Maggs (2006) found that college-bound seniors who were more academically motivated had fewer "plans" for alcohol consumption. Although one study found no association between achievement strivings and alcohol use (Simons et al., 2006), Wechsler et al. (1995) found that students who rated academic work as not important and who spent less time studying were more likely to be binge drinkers. Additional studies have found inverse associations between grade point average and alcohol use (Porter & Pryor, 2007; Singleton, 2007). There is also evidence that academic motivation in high school is predictive of later alcohol use. For example, Bryant and colleagues (2003) found that several academic factors in high school predicted not only concurrent substance use, but also substance use through age 20. Another study investigating adolescent risk factors for alcohol use also found that college plans predicted more 30 day alcohol use and heavy drinking at age 22, but not at age 35 (Merline, Jager, & Schulenberg, 2008). Further, high school grade point average also inversely predicted heavy drinking at age 22 and truancy in high school predicted more 30-day alcohol use.

Although the vast majority of research in this area has focused on alcohol use as an outcome, it seems reasonable to expect that strong academic motives and activities would protect against the associated negative consequences of drinking. Alcohol-related academic problems (e.g., missing class, performing poorly in academic work) are common among college students (Perkins, 2002) and are included in measures of alcohol-related problems, such as the Rutgers Alcohol Problem Index, which was included in the current study (White & Labouvie, 1989). Individuals with higher levels of academic motives/behaviors may be less likely to let alcohol use interfere with their academic responsibilities, which is consistent with the finding that stronger achievement strivings were related to fewer alcohol problems over time (Simons, Christopher, & McLaury, 2004).

Although there is considerable evidence to suggest that an academic orientation may be protective against alcohol use and problems for many students (Hawkins et al., 1992; Wechsler et al., 1995), there is also evidence that academic pressures may be linked to greater alcohol use for some students, particularly men (McCormack, 1996). For these individuals, academic pursuits may be related to pressures to succeed and could lead to drinking as a means to cope. Longitudinal studies in diverse samples of college students are needed to clarify the nature of the relation between academic motives/behaviors and drinking behavior.

In addition to academic pursuits, the development of new peer networks is a primary and competing goal, especially during the first year of college (Boutte et al., 2007; Pancer et al., 2000). Alcohol use is an important part of the many social contexts in which new social relationships are developed (White & Jackson, 2004/2005). Indeed, alcohol use occurs at social activities both on and off campus (Harford, Wechsler, & Seibring, 2002) and students often cite social reasons for drinking (LaBrie, Hummer, & Pederson, 2007). Further,

interpersonal strivings have been associated with increased alcohol use (Simons et al., 2006). Rating parties as very important and reporting more time socializing have also been positively associated with the likelihood of heavy drinking (Sher & Rutledge, 2007) and binge drinking (Wechsler et al., 1995). Although alcohol expectancies (beliefs about the benefits of drinking) may play a strong role in the social facilitation that students report from drinking, there may also be a pharmacological basis for social benefits of drinking. A recent placebo-controlled, lab-based study found that alcohol aided the development of social bonds among study participants (Kirchner, Sayette, Cohn, Moreland, & Levine, 2006). Taken together, these findings suggest that social motives/behaviors are an important risk factor for heavy drinking among college students. As with research on academic motives and behaviors, studies of social motives and behaviors have tended to focus exclusively on alcohol use (or binge drinking) as the outcome of interest. Once again, there is reason to suspect that social motives and behaviors may also be important in understanding risk for alcohol-related problems. Individuals with strong social motives are likely to drink in social contexts in which high-risk patterns of drinking (e.g. drinking games) may lead to higher blood alcohol concentrations and associated consequences (e.g. vomiting, blacking out). Social contexts also provide increased opportunities for the occurrence of interpersonal consequences of drinking (e.g. conflict with peers, aggression, high-risk sexual behavior). Frequent engagement in alcohol-related social activities might also leave less time for academic or other obligations, contributing to academic problems.

Once students negotiate the initial transition to college and are able to evaluate their academic performance and the quality of their social relationships, the relative importance of academic and social motives may begin to shift, such that social motives weaken and academic motives become more prominent. Perhaps students who develop strong social networks during the initial transition to college turn their attention to academic decisions such as choosing majors and setting long-term career goals (i.e., maintaining a grade-point average that will allow them to compete for jobs or graduate training). A greater emphasis on academic motives/behaviors in later years of college may also be prompted by poor academic performance, or may result from the more academically inclined students persisting in college, whereas those with poorer performance drop out. Thus, regardless of the mechanisms, one might expect to see a decline in the influence of social motives and behaviors and an increase in the influence of academic motives and behaviors as students progress through college. Longitudinal studies demonstrating a natural maturational process with respect to changing motives and corresponding behavior might provide clues about ways to facilitate such changes earlier in the transition to college, thereby reducing the risks associated with this developmental period.

Although academic and social motives and behaviors are likely to be important influences for all students, the relative role of these competing interests may differ significantly across groups that vary with respect to risk for heavy drinking. Specifically, group differences by gender, race/ethnicity, and family history of alcohol use have been consistently reported for alcohol use. Men report more "heavy drinking" than women (Johnston, O'Malley, Bachman, & Schulenberg, 2007), and Caucasian students report more alcohol use than Latino and African American students (O'Malley & Johnston, 2002). Other studies have also found that Caucasian and Latino students drink more than Asian American students (Fromme et al., 2008). Finally, there is considerable evidence that students with a parental history of alcohol problems are at greater risk for heavy drinking and related consequences (Wechsler et al., 1995). In addition to heavier drinking during the college years, these groups are at risk of failing to "mature out" of heavy drinking as they leave college (Jackson, Sher, Gotham, & Wood, 2001). Thus, academic and social motives might differ for these groups both during the initial transition to college and as students progress through the college years.

Racial/ethnic minority students are more likely than Caucasian students to be the first in their families to attend college which may make academic motives more salient for these students (Bui, 2002). Conversely, groups such as Caucasian students who are identified as high-risk for alcohol use during the college years may evidence a stronger influence of social motives and behaviors during the initial transition to college. In addition, groups known to be at risk of failing to “mature out” of heavy drinking (men and those with a positive family history of alcoholism) may fail to shift from social to academic motives/behaviors as they progress through college.

The aim of the current study was to investigate whether academic and social motives and behaviors impact alcohol use and problems during the initial transition from high school to college and during the early years of college. We hypothesized that social motives and behaviors would predict a deviation from expected alcohol use and problems such that stronger social motivations and more frequent engagement in social behaviors would predict greater alcohol use and more alcohol-related problems than expected based on the individuals’ patterns of behavior over time. Further, we expected this effect to be most prominent during the initial transition to college when socially motivated individuals would be exposed to a host of new social opportunities, many of which involve alcohol. Conversely, academic motives and behaviors were hypothesized to attenuate alcohol use and the experience of negative alcohol-related consequences, particularly during sophomore year as peer networks become more developed. Given overall increased risk for heavy drinking among Caucasian and male students, and among those with a positive family history of alcoholism, we anticipated differences in the relations among the study variables across groups. More specifically, we expected social motives/behaviors to play an even stronger role during the initial transition to college for these high-risk groups. We also expected weaker relations between academic motives/behaviors and drinking behavior for high-risk students, particularly after the first year of college when these motives/behaviors may have the greatest influence.

Method

Participants

The sample comprised 1,447 students drawn from a larger sample of 2,245 students who completed the first of eight surveys across 5 years as part of “The UT Experience!” a longitudinal study of alcohol and other behavioral risks during the initial transition from high school to college and throughout the college years. Of the total sample of 2,245, 59.8% ($N = 1,331$) were women and 40.2% ($N = 896$) were men. The majority of participants were Caucasian (54%) though there were relatively large percentages of Hispanic/Latino (15.2%) and Asian-American (18%) students. Other ethnic/racial groups included African-American (4.2%) and multi-ethnic (6.6%) students, with fewer than 1% identifying as American-Indian/Alaskan Natives or Native Hawaiian/Pacific Islanders, and 1.6% choosing not to report their race/ethnicity. Only Caucasian, Latino, and Asian-American students were included in the analyses as the sample sizes for the remaining groups were not sufficient for inclusion in multi-group structural equation models. In addition, participants for whom family history status could not be definitely determined were excluded from analyses. Analyses were based on data from the first five waves of data collected during senior year of high school (wave 1), freshman year of college (waves 2 and 3) and sophomore year of college (waves 4 and 5).

Measures

Alcohol use—Typical quantity and frequency of alcohol use and two indices of heavy drinking were assessed. Typical frequency and quantity were assessed with the revised Daily

Drinking Questionnaire (DDQ-R; Kruse, Corbin, & Fromme, 2005), which is designed to more clearly differentiate frequency and quantity of alcohol use relative to the original DDQ (Collins, Parks, & Marlatt, 1986). For each day of the week, participants reported the number of weeks during the past 3 months on which they consumed alcohol (e.g. how many of the past 13 Mondays they consumed alcohol). The number of weeks on which drinking occurred was summed across the 7 days and divided by 13 to yield an index of the number of drinking days per week (frequency). Participants also reported the total number of drinks consumed for each day of the week during the past 3 months. These values were summed and divided by 13 to generate a measure of total weekly consumption. Weekly consumption was then divided by drinking frequency to yield the average number of drinks per drinking day (quantity). Drinking to intoxication was assessed with a single item asking participants how often in the past 3 months they “got drunk (not just a little high) on alcohol?” (Jackson et al., 2001). A single item was also used to assess frequency of heavy episodic drinking, defined as five or more drinks on one occasion (four or more for women; Wechsler & Isaac, 1992). The items comprising the alcohol use composite were standardized using the grand mean and standard deviation across the five assessments to place them on the same scale before summing to create the composite score. Internal reliability of the four-item composite was excellent (alphas ranged from .92 to .93 across the five assessments).

Alcohol-related problems—The Rutgers Alcohol Problem Index (RAPI) was used to measure alcohol related problems (White & Labouvie, 1989). The RAPI is a 23-item self-report measure that assesses the frequency of adverse consequences of alcohol use. Responses range from 1 (never) to 5 (more than 10 times). Prior studies have demonstrated good internal reliability and validity, and internal consistency reliabilities in the current study ranged from .91 to .93 for the five semesters assessed.

Social and academic motives and behaviors—Two categories of personal motivations were assessed; social (six items, e.g., make new friends), and academic (three items, e.g., do well in all your courses). Response options ranged from 1 = not at all important to me, to 5 = very important to me. Both social and academic motives have been shown to have adequate internal reliability, with alphas of .80 and .82, respectively, and good content validity (Maggs, 1997). Related behaviors were also assessed in each domain with four items assessing social behaviors and five items assessing academic behaviors. Participants were asked to indicate the number of times/hours spent during the average week in the last 3 months in a variety of social and academic behaviors. Social behaviors included the number of times that participants reported “going out for fun,” “attending small social gatherings,” and “attending large parties or social events,” and the number of hours spent with friends. Academic behaviors included the number of times the participant “missed class or work,” “failed to do an assignment,” and “failed to study for an exam or quiz,” and the number of hours spent in classes and studying or working on assignments outside of class. Items on missed classes, assignments, and failure to study for exams/quizzes were reverse scored to reflect greater involvement in academic behaviors. Because motives and behaviors were not assessed on the same scale, all items were standardized using the grand mean and standard deviation across all five assessments before creating summary social and academic motives/behaviors scores. Internal reliabilities of the social motives/behaviors measure ranged from .75 to .80 over the five assessment points. Internal reliability of the academic motives/behavior scale was low at the high school assessment ($\alpha = .62$) but was adequate during the college years (range of .70 to .76).

Family history of alcohol problems—The Family Tree questionnaire (Mann, Sobell, Sobell, & Sobell, 1985) was used to collect information about history of alcohol problems in parents, siblings, and grandparents. Research with the instrument has established good test-

retest reliability (kappa values between .78 and .94) over a 2-week period. Evidence for validity of the measure comes from research demonstrating a greater number of family history positive relatives among alcohol abusers. Participants were asked to classify each family member as a non-drinker, social drinker, possible problem drinker, or definite problem drinker. Participants were classified as having a positive family history of alcohol problems if they indicated a probable or definite alcohol problem in either parent. Only participants who reported no first or second degree relatives with probable or definite alcohol problems were classified as family history negative. Participants who reported probable or definite alcohol problems in second degree family members (but not in either parent) were not included in analyses using the family history variable as they could not clearly be categorized as family history positive or negative.

Procedures

Participants were recruited from the 2004 incoming freshman class ($N = 6,391$) at The University of Texas, Austin, based on information provided by the University Registrar. Incoming students were recruited during freshman orientation sessions in the summer prior to matriculation at which time they were asked to complete a contact form with demographic information and limited information about alcohol use. Students who provided contact information ($N = 4,832$) and met inclusion criteria (unmarried first-time college students) were assigned to one of the three study samples (high-school and senior year assessments, senior year assessment only, and semi-annual longitudinal assessments). The sample of 3,095 students assigned to the longitudinal condition was the focus of the current study. Those who provided informed consent or assent and received parental consent were invited to participate by completing the high school version of an online survey. A total of 2,245 (72.5%) students assigned to the longitudinal condition completed the high school assessment. Comparisons of those who did and did not complete the high school survey found that non-completers were more likely to be male and more likely to be heavy drinkers (See Corbin, Vaughan, & Fromme, 2008 for details of these analyses). All surveys were administered in web-based format by DatStat Inc. (Seattle, WA), an internet-based research company that provides 128-bit encryption of the data and extensive firewalls to protect the confidentiality of participant responses. Participants were re-contacted at the end of each semester of college and asked to complete a similar survey (though the fall surveys included an abbreviated set of measures). Reminder emails were sent by the web-administrator if the participant did not complete the survey within 10 days of the first email prompt.

Data Management and Analytic Plan

Prior to testing the study hypotheses, descriptive statistics and distributions were examined to identify potential outliers. Values greater than 3 standard deviations from the mean were excluded when they were clearly separated from the rest of the distribution of scores. A total of 18 cases (.01% of the sample) were excluded, leaving a sample of 2,227. After removal of outliers, distributions remained non-normal in the high school data (skewness values ≥ 3) for two of the four drinking variables (bring drinking and drinking to intoxication) and alcohol-related problems. After log-transformations, skewness values for each measure were less than 1.5. Distributions for all of the drinking variables were then standardized before creating the composite score (mean of the four items). Of the 2,227 students at the high school assessment, 2,059 (92.5%) completed the freshman fall survey, with 2,007 (90.1%) completing the freshman spring survey, 1,881 (84.5%) completing the sophomore fall survey, and 1,774 (79.7%) completing the sophomore spring survey. Missing data was handled through the standard error of the mean framework, which estimates means and intercepts based on all available data using maximum likelihood estimation.

The sample used to test hypotheses related to alcohol use did not include those students who could not be classified as family history positive or negative and/or who did not identify as Caucasian, Latino, or Asian American, leaving a final sample of 1,447. Participants who did not drink at any time-point ($N = 264$; 23%) were also excluded from the analyses regarding alcohol-related problems, resulting in a sample size of 1,183 for these analyses. Initially, the underlying trajectories for use and problems were identified through separate unconditional growth models. Initial models included an intercept and slope representing linear growth for the outcome of interest (alcohol use or problems) with loadings to the intercept latent variable set at 1 and loadings to the slope latent variable set at values of 0 through 4, corresponding to the five waves of data. We also tested models with three latent variables, with the third latent variable representing quadratic growth (fixed regression weights of 0, 1, 4, 9, and 16). The model with the quadratic latent variable was retained if model fit was significantly improved relative to the model including only a linear growth latent variable. Error terms for the drinking outcomes over the five time points were expected to be significantly correlated, but the unconditional models did not have enough degrees of freedom to freely estimate correlations among all of these error terms. Thus, covariation among the error terms was selectively modeled based on modification indices.

After testing the unconditional models, gender, race/ethnicity, and family history of alcoholism were added as predictors of alcohol use/problems intercepts and slopes. Covariation among these variables was also modeled. Next, motives/behaviors (social and academic) were added as time-varying covariates to each of the growth models. Directional paths from motives/behaviors to alcohol use/problems were added within each time point, and correlations among both academic and social motives/behaviors across time were included. Alcohol use variables were added as additional time-varying covariates in the alcohol related problems models. The time-varying covariate models test the hypothesis that motives/behaviors are associated with a semester-specific deviation from expected alcohol use or problems. For example, a positive association between the covariate of social motives/behaviors and drinking in a given semester would indicate that individuals with strong social motives/behaviors drink more than would be expected given their underlying trajectory for alcohol use. For an excellent example of a time-varying covariate model using structural equation modeling, see Hussong, Curran, Moffitt, Caspi, & Carrig (2004).

Multigroup analyses examined differences in the relations between motives/behaviors and alcohol related outcomes by gender, racial/ethnic group, and family history of drinking problems. The variable of interest for the particular multigroup analysis (e.g. gender) was removed as a predictor from the model. Multigroup models compare two models that are fit to the same data. The first model allows the relations between the time-varying covariates (motives/behaviors) and alcohol use or problems to differ by group, whereas the second model fixes the relations among these variables to be the same across groups. When overall model fit differed between the two models, critical ratios were examined to determine which of the structural weights significantly differed by group. Critical ratios are based on the distribution of z scores, such that absolute values of 1.96 or greater indicate significant group differences at the .05 level.

Results

Unconditional Growth Models

The alcohol use unconditional growth model including a latent variable for quadratic growth fit the data significantly better than the model including only linear growth, though the model still did not provide adequate fit to the data, $\chi^2 = 56.90$, $p < .001$; comparative fit index (CFI) = .99; incremental fit index (IFI) = .99; root mean square error approximation (RMSEA) = .10. Modification indices suggested that allowing the path between the error

terms for fall of freshman and sophomore years to covary would significantly improve model fit. Adding this path resulted in good model fit, $\chi^2 = 27.34$, $p < .001$; CFI = 1.00; IFI = 1.00; RMSEA = .07, and indicated that there was an increase in alcohol use during freshman year of college followed by more stable use during sophomore year. Table 1 displays means and standard deviations for alcohol use and alcohol-related problems over time. In contrast to the model for alcohol use, the model for alcohol-related problems with only one latent growth variable (linear) fit the data better than the model with the addition of a quadratic latent growth variable. However, the linear growth model did not provide adequate fit to the data, $\chi^2 = 75.45$, $p < .001$; CFI = .96; IFI = .97; RMSEA = .09, without correlated errors. Modification indices suggested that allowing two paths between adjacent error terms (times 2 and 3 and times 3 and 4) to covary would significantly improve model fit. Adding these paths resulted in excellent model fit, $\chi^2 = 9.53$, $p = .09$; CFI = 1.00; IFI = 1.00; RMSEA = .03, and showed a relatively linear increase in alcohol-related problems from high school through the end of sophomore year. For both alcohol use and problems, there was significant within subject variability in both the intercepts, $p < .001$, and slopes, $p < .001$, indicating that examination of variables associated with individual differences in drinking and alcohol problems over time was appropriate.

Conditional Growth Models

Effects of demographic predictors of alcohol use—The model with only the demographic predictors of the intercept and slope provided good fit to the data, $\chi^2 = 48.71$, $p < .001$; CFI = .99; IFI = .99; RMSEA = .05. There were significant differences in the intercept by race/ethnicity and family history of alcohol problems. Latino ($b = -.18$, $SE = .07$) and Asian-American ($b = -.51$, $SE = .06$) students reported lower levels of high school drinking than Caucasian students and individuals with a positive family history of alcohol problems reported greater high school drinking than those with a negative family history, $b = .31$, $SE = .06$. Latino and Asian-American students also showed smaller increases in alcohol use over time, relative to Caucasian students, $b = -.17$, $SE = .06$; $b = -.13$, $SE = .05$. There were no significant differences between men and women in the intercepts or slopes for alcohol use (p values $> .05$).

Academic and social motives/behaviors and alcohol use—For the model in which academic and social motives/behaviors served as predictors of alcohol use, the overall model showed good fit, $\chi^2 = 240.67$, $p < .001$; CFI = .99; IFI = .99; RMSEA = .05 (see figure 1 for all significant paths with standardized coefficients). There was a significant inverse relation between academic motives/behaviors and alcohol use from high school through spring of sophomore year. Stronger academic motives and more frequent engagement in academic behaviors (e.g., studying, completing assignments) were associated with lower levels of drinking at each time point. Social motives/behaviors also predicted alcohol use at all time-points, with greater social motives/behaviors associated with greater levels of drinking than expected. Table 2 presents means and standard deviations for the academic and social motives and behaviors over time. Tables 3 through 6 provide standardized coefficients, unstandardized coefficients, and standard errors by gender, family history, race/ethnicity, and the total sample.

Multigroup modeling by gender revealed a decrement in model fit when holding the structural weights constant, $\chi^2 = 31.05$, $DF = 19$, $p < .05$, suggesting that the unconstrained model (which allows the relations among study variables to differ by gender) fit the data best. Model fit for the unconstrained model was good, CFI = .98, IFI = .98, RMSEA = .04. Table 3 presents the standardized coefficients, unstandardized coefficients, and standard errors by gender and family history. Examination of critical ratios found that the relation between academic motives/behaviors and alcohol use differed by gender during spring of

freshmen year, and spring of sophomore year. For women, significant inverse relations between academic motives/behaviors and alcohol use emerged in the fall of freshman year, $b = -.09$ ($SE = .03$), and persisted through spring semester of sophomore year, with an unstandardized coefficient of $-.11$ ($SE = .03$). For men, there was an inverse relationship between academic motives and alcohol use, $b = -.09$ ($SE = .04$), only during senior year of high school. Thus, more engagement in academics appeared to serve as a relatively consistent protective factor for women, whereas it served as a protective factor for men only during senior year in high school. The critical ratios for social motives revealed no significant differences between men and women at any time point.

The multigroup model for racial/ethnic differences also revealed a decrement in model fit when holding structural weights constant, $\chi^2 = 105.49$, $DF = 32$, $p < .001$ suggesting the unconstrained model fit the data best. The unconstrained model achieved good model fit, $CFI = .98$, $IFI = .98$, $RMSEA = .03$. Critical ratios revealed only one parameter that differed significantly by group with respect to academic motives/behaviors. During the fall semester of sophomore year, the relation between academic motives and alcohol use was significant and inverse for Latino, $b = -.17$, $SE = .05$, but not for Asian American students. In contrast, there were many parameters that differed significantly by group for social motives/behaviors. Asian American students differed from both Caucasian and Latino students during all semesters. For both Caucasian and Latino students, stronger social motives were associated with greater alcohol use than expected at each time point. Caucasian and Latino students had significant positive relations beginning in high school, $b = .33$ ($SE = .04$) and $b = .29$ ($SE = .07$), respectively. The magnitude of these relations increased during the college years with a peak of $b = .51$ ($SE = .03$) for Caucasian students and a peak of $b = .43$ ($SE = .06$) for Latino students in the fall of freshman year of college. The same general pattern of relations was observed for Asian-American students, but the magnitude of the relations was smaller, with $b = .13$ ($SE = .04$) in high school, and coefficients in college ranging from $b = .21$ ($SE = .04$) in fall of freshman year to a high of $b = .26$ ($SE = .04$) in fall of sophomore year. Latino and Caucasian students differed in the relations between social motives/behaviors and alcohol use only during fall of freshman year, when the magnitude of the positive relation was significantly stronger for Caucasian students.

Finally, a multigroup model testing group differences by family history status found a decrement in model fit when constraining the structural weights, $\chi^2 = 37.52$, $DF = 19$, $p < .01$. The unconstrained model achieved good fit to the data, $CFI = .98$, $IFI = .98$, $RMSEA = .04$. There was a significant group difference for academic motives/behaviors during fall of sophomore year. Both students with a positive family history ($b = -.16$, $SE = .05$) and students with a Negative family history ($b = -.06$, $SE = .02$) had significant inverse relations between academic motives/behaviors and alcohol use, but the magnitude was stronger for those with a positive family history. For social motives/behaviors, there were group differences during fall of freshman year and during sophomore year. Students with a positive family history had significant positive relations between social motives/behaviors and alcohol use beginning in high school, with $b = .36$ ($SE = .06$), increasing in fall of freshman year to $b = .55$ ($SE = .06$), and persisting through spring of sophomore year, $b = .58$ ($SE = .07$). For those students without a family history the pattern was similar, but the magnitude of the relations was smaller with $b = .23$ ($SE = .03$) for senior year in high school, increasing to $b = .38$ ($SE = .03$) in fall of freshman year and remaining stable through spring of sophomore year with $b = .35$ ($SE = .03$).

Effects of demographic predictors on alcohol-related problems—The model with only the demographic predictors of the intercept and slope provided excellent fit to the data, $\chi^2 = 28.70$, $p = .04$; $CFI = .99$; $IFI = 1.00$; $RMSEA = .02$. Results paralleled the demographic only model for alcohol use, with significant differences in the intercept by

race/ethnicity and family history of alcohol problems, but not for gender ($p = .74$). Latino ($b = -.08$, $SE = .03$) and Asian-American ($b = -.11$, $SE = .03$) students reported lower levels of high school alcohol-related problems than Caucasian students, and individuals with a positive family history of alcohol problems reported more high school alcohol-related problems than those with a negative family history, $b = .16$, $SE = .03$. There were no significant group differences for slopes representing changes in alcohol-related problems over time.

Academic and social motives/behaviors and alcohol-related problems—The model using academic and social motives/behaviors to predict deviations from the expected course of alcohol-related problems showed good model fit, $\chi^2 = 146.56$, $p < .001$; CFI = .99; IFI = .99; RMSEA = .03 (see figure 2 for all significant paths with standardized coefficients). Alcohol use was significantly and strongly positively related to alcohol related problems at each semester with standardized coefficients ranging from .63 to .73. There were significant inverse relations between academic motives/behaviors and alcohol-related problems at each semester. Overall, stronger academic motives and more frequent academic activities were associated with lower levels of alcohol-related problems. Social motives/behaviors were not significantly associated with problems in high school, but were positively related to alcohol-related problems during each semester of college, such that more social motivations and behaviors predicted greater alcohol problems.

Multigroup analyses by gender revealed a decrement in model fit when holding the structural weights constant, $\chi^2 = 35.72$, $p < .05$. Men and women differed in the relation between academic motives/behaviors and alcohol-related problems only during fall of sophomore year. For women the relation at this time point was inverse and significant ($b = -.11$, $SE = .02$) while for men it was not significant ($b = -.01$, $SE = .02$). There were no gender differences in the relations between social motives/behaviors and alcohol-related problems.

There was also a decrement in model fit when holding the structural weights constant by racial/ethnic group, $\chi^2 = 65.37$, $p < .01$. Critical ratios indicated that the relation between academic motives/behaviors and alcohol-related problems significantly differed between Latino and Caucasian students during fall of freshman year, with a stronger inverse association between academic motives/behaviors and alcohol related problems for Latino students ($b = -.13$, $SE = .03$) than for Caucasian students ($b = -.04$, $SE = .02$). The same pattern emerged in the contrast between Latino and Asian-American students, with academic motives/behaviors serving a stronger protective influence for Latino students ($b = -.10$, $SE = .02$), than for Asian American students.

Multi-group analyses investigating differences by family history revealed model invariance when holding structural weights constant, $\chi^2 = 13.13$, $p = .90$. As such, there were no differences between those with and without a family history of alcohol problems in the relations between academic and social motives and alcohol-related problems.

Discussion

Results from this study reveal the salient role of social and academic motives and behaviors in alcohol use and alcohol-related problems during the early college years. Social motives and behaviors were consistently associated with both alcohol use and problems across all time points, with the exception of alcohol-related problems in high school. These results are consistent with the existing literature indicating that social motivations play an important role in college drinking behavior (LaBrie, Hummer, & Pederson, 2007; White & Jackson, 2004/2005). Although smaller in magnitude, inverse associations were found between

academic motives/behaviors and trajectories of both alcohol use and problems. The results also identified important group differences in the relations between motives/behaviors and both alcohol use and problems.

Interesting group differences emerged with respect to academic motives/behaviors. For women, being more academically oriented was protective and at each semester during college predicted an attenuation of alcohol use. These results are consistent with the view that being academically oriented may reflect more conventional attitudes contributing to lower levels alcohol use (Baer, 2002). Conversely, stronger academic motivations and more frequent academic behaviors were only protective against alcohol use during senior year of high school among men. A similar pattern emerged for alcohol related problems, with academic motives/behaviors serving a protective role for women, but not for men, during spring of sophomore year of college. These results are striking and, perhaps, speak to important gender differences in risk and protective factors for alcohol use across developmental transitions.

Racial and ethnic differences also emerged with respect to the relations between academic motives/behaviors and alcohol use and problems. Latino students had a stronger inverse relation between academic motives/behaviors and alcohol use during the fall of sophomore year relative to Caucasians students. Latino students also had a stronger protective effect of academic motives/behaviors on alcohol related problems relative to Asian-American students in fall of freshman year. Taken together, these results illustrate the particular importance of the role that academic engagement plays in both the alcohol use and associated consequences for Latino students.

Results related to differences in family history status also emerged for alcohol use. Academic motives and behaviors were protective against alcohol problems for those without a family history of alcohol use beginning in high school and persisting through fall of sophomore year of college. For those with a family history of alcohol problems, academic motives and behaviors were protective only during fall of sophomore year. This result has important implications for prevention, as those at greatest risk (positive family history) would appear less likely to benefit from efforts to increase academic engagement.

Social motives and behaviors yielded the strongest influence on alcohol use during the transition from high school into college. This result is not surprising given the developmental tasks of building peer networks and close relationships during this time period (Arnett, 2005; Collins & van Dulmen, 2006), and evidence that many social activities are centered around drinking (White & Jackson, 2004/2005). The role of social motives/behaviors for both alcohol use and problems remained important through spring of sophomore year.

The influence of social motives and behaviors on alcohol use differed by both race/ethnicity and family history status. Social motives were a much stronger predictor of alcohol use among Caucasian and Latino students than among Asian-American students. Although college attendance has been associated with lower rates of heavy drinking for Asian-American students (Paschall, Bersamin, & Flewelling, 2005), the powerful nature of social motives/behaviors still emerged as a risk factor upon arrival to college and during the early college years for this group. Still, the weaker relation for this group is consistent with prior research suggesting that Caucasians are more likely to drink as a part of social activities than Asian-American students (O'Hare, 1995). There may be additional cultural factors that protect socially engaged Asian-American students from an escalation in alcohol use; these factors should be identified in future studies.

Results contrasting family history groups revealed differences in the relations between social motives/behaviors and alcohol use at all semesters. The positive relations between social motives and behaviors across all groups highlight the universal importance of developing new peer networks during the initial transition to college (Collins & van Dulmen, 2006) and the presence of alcohol in many of these situations (White & Jackson, 2004/2005). Still, for those students with a family history of alcohol problems, social motives and behaviors were more strongly related to alcohol use during the early college years. Future research on characteristics of students with a positive family history of alcoholism (e.g. sensation seeking, impulsivity) that might contribute to the persistent influence of social motives on drinking is needed.

The findings from the current study have several important implications for the development of prevention initiatives with college students. With respect to the role of social motives, although it is unrealistic to ask college students to refrain from engaging in social activities, it is possible for college administrators to provide students with alcohol-free social activities or activities that are less likely to involve heavy drinking. Prevention initiatives can also be personalized to address risks unique to each student. This would allow for special attention to different risk groups, including Caucasian and Latino students and students with a family history of alcohol problems. For example, alternative social activities (e.g. night-time intramural sports games) might be attractive to and useful for these high-risk groups. Many alcohol-free activities are rated as highly enjoyable by college students (Murphy, Barnett, & Colby, 2006), and a recent study found that decreases in alcohol use after a brief intervention were associated with increases in reinforcement from substance-free activities (Murphy, Correia, Colby, and Vuchinich, 2005). Interventions that explore how a student's social motivations are related to their alcohol use may also be useful in increasing awareness of the power of social influences on alcohol use and the acceptability of alcohol-free social activities. Finally, interventions might include a social skills component that fosters and encourages the development of friendships outside of the context of drinking.

Being academically motivated and engaging in academic behaviors was protective for women, but not for men, suggesting that different prevention approaches may be needed. For women, further reinforcement of academic motivations and behaviors may facilitate the protective role of these activities on alcohol use. Academic motives also played a protective role for Caucasian and Latino students in terms of alcohol-related problems, suggesting that a promotion of academic engagement may be a useful prevention tool for these groups. Research on the outcomes of prevention programs suggests that such an approach may have utility. For example, Murphy et al. (2005) found that intervention efforts with college students resulted in increases in academic substance free reinforcement. For Asian-American students, this may be a less fruitful approach, perhaps due to relatively stable levels of academic motivation and lower levels of alcohol use relative to their Caucasian and Latino counterparts.

Although important, the results of the current study should be considered in the context of limitations to the study design and methods. First, all measures were self-report without collateral reports, so there is the possibility of self-presentation bias. This may have been particularly problematic for assessments of academic motives as there was less variability on this measure, with most students indicating that academics were moderately to highly important. This measurement issue may account, at least to some extent, for the smaller size of the associations between academic motives/behaviors and alcohol-related outcomes. It is also important to note that we combined motives and behaviors into single academic and social measures. This might obscure differences in relations of each with alcohol use and problems. Future studies looking at unique effects of motives and behaviors will be important in clarifying their relative influences. Another limitation of the study is that

participants provided retrospective reports from the past three months at each wave of data collection, introducing potential recall bias. Although these are potential limitations, there is considerable evidence that self-reports of substance use are accurate when necessary conditions (i.e., confidentiality, privacy) are met (Babor, Stephens, & Marlatt, 1987). Finally, the web-based survey design provides a useful way to collect data from large numbers of students, but also has limitations. There are fewer controls over the conditions under which the survey is completed. It is possible that bias is being introduced due to inattention, multi-tasking, intoxication, or the presence of other people or distractions.

Despite inherent limitations, the current study provides new information about the relative importance of academic and social motives/behaviors in relation to alcohol use and problems during the transition from high school into the first two years of college. The time-varying covariate models allowed for contemporaneous analysis of social and academic motives/behaviors and alcohol use over time. As such, deviations from the expected alcohol use and alcohol-related problems were identified in relation to changes in motivations and behavior. This approach not only allows the identification of risk and protective factors, but also provides a method for determining the specific time points at which they exert a significant influence. For example, in the current study social motives and behaviors appeared to exert their greatest influence on alcohol use during freshmen year of college. Further, we found that academic motives/behaviors were only protective against alcohol use for men during senior year in high school. A better understanding of time-specific effects of motivations and behaviors provides important insights into the nature and timing of risk for specific sub-groups and has implications for the development of more effective alcohol prevention programs for college students.

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Figure 1. Academic and Social Motives/Behaviors and Alcohol Use. Standardized Coefficients are presented: AcMB = Academic Motives/Behaviors; SocMB = Social Motives/Behaviors; AlcUse = Alcohol Use; FamHx = Family History. * $p < .05$. ** $p < .01$.

Figure 2. Academic and Social Motives/Behaviors and Alcohol-Related Problems. Standardized Coefficients are presented: SocMB = Social Motives/Behaviors; AcMB = Academic Motives/Behaviors; AlcUse = Alcohol Use; RAPI = Rutgers Alcohol Problem Index; FamHx = Family History. $*p < .05$. $**p < .01$.

Table 1

Descriptive Statistics for Alcohol Use and Alcohol-Related Problems

	Mean	SD	Range	Skewness	Kurtosis
Frequency of Alcohol Use					
HS Senior	.47	.80	0–6.15	2.65	9.11
Freshman Fall	.74	1.03	0–7.00	1.88	4.59
Freshman Spring	.79	1.03	0–7.00	1.58	2.59
Sophomore Fall	.86	1.04	0–6.46	1.47	2.07
Sophomore Spring	.83	1.05	0–7.00	1.60	2.78
Quantity of Alcohol Use					
HS Senior	1.84	2.50	0–16.83	1.64	3.23
Freshman Fall	2.40	2.68	0–18.72	1.29	2.45
Freshman Spring	2.63	2.84	0–18.30	1.27	2.20
Sophomore Fall	2.74	2.78	0–20	1.39	3.70
Sophomore Spring	2.54	2.57	0–14.21	1.02	1.07
Frequency of Drinking to Intoxication ^a					
HS Senior	1.57	3.88	0–40	4.40	26.47
Freshman Fall	2.47	5.43	0–50	3.80	18.34
Freshman Spring	3.00	5.74	0–46	3.10	11.90
Sophomore Fall	3.18	5.66	0–40	2.75	8.81
Sophomore Spring	3.19	6.07	0–50	3.15	12.57
Frequency of Binge Drinking ^a					
HS Senior	2.02	4.75	0–38	3.42	13.14
Freshman Fall	2.82	5.67	0–50	3.19	12.80
Freshman Spring	3.42	6.73	0–52	3.09	11.58
Sophomore Fall	3.71	6.60	0–45	2.59	7.32
Sophomore Spring	3.59	7.08	0–54	3.22	12.67
RAP ^{a,b,c}					
HS Senior	2.41	5.47	0–78	5.17	43.91
Freshman Fall	3.26	6.04	0–65	3.86	21.76
Freshman Spring	3.34	6.06	0–57	3.69	19.88

	Mean	SD	Range	Skewness	Kurtosis
Sophomore Fall	3.49	6.24	0–69	3.98	24.31
Sophomore Spring	3.17	6.23	0–53	3.63	17.31

^aPre-log transformed.

^bRAPI = Rutgers Alcohol Problem Index.

^cValues do not include participants who reported no alcohol use.

Table 2

Descriptive Statistics for Academic and Social Motives/Behaviors

	Mean	SD	Range	Skewness	Kurtosis
<i>Academic motives</i>					
HS Senior	4.88	.37	1–5	–4.46	26.91
Freshman Fall	4.74	.52	1–5	–2.44	6.76
Freshman Spring	4.68	.59	1–5	–2.32	6.22
Sophomore Fall	4.66	.64	1–5	–2.46	7.32
Sophomore Spring	4.66	.61	1–5	–2.04	4.35
<i>Academic behaviors^a</i>					
HS Senior	3.25	.77	0–4.0	–1.41	2.10
Freshman Fall	3.08	.73	0–4.0	–1.20	1.73
Freshman Spring	3.03	.74	0–4.0	–1.08	1.47
Sophomore Fall	3.06	.73	0–4.0	–1.13	1.77
Sophomore Spring	3.06	.73	0–4.0	–1.00	1.21
<i>Hours Spent in class and studying or on assignments^b</i>					
HS Senior	2.72	.74	.5–4	–.23	–.19
Freshman Fall	2.80	.75	.5–4	–.05	–.49
Freshman Spring	2.79	.78	0–4	–.20	–.11
Sophomore Fall	2.84	.78	0–4	–.28	–.04
Sophomore Spring	2.79	.81	0–4	–.36	.11
<i>Social motives</i>					
HS Senior	3.51	.67	1–5	–.23	.06
Freshman Fall	3.31	.70	1–5	–.04	.07
Freshman Spring	3.24	.69	1–5	–.06	.07
Sophomore Fall	3.18	.72	1–5	–.04	.07
Sophomore Spring	3.13	.69	1–5	.04	.06
<i>Social behaviors^a</i>					
HS Senior	2.48	.92	0–4.0	–.19	.13
Freshman Fall	2.45	.93	0–4.0	–.12	.13
Freshman Spring	2.47	.93	0–4.0	–.13	.13

	Mean	SD	Range	Skewness	Kurtosis
Sophomore Fall	2.46	.92	0–4.0	–.11	.14
Sophomore Spring	2.42	.89	0–4.0	.02	.14
Hours spent with friends ^c					
HS Senior	2.42	1.10	0–4.0	.05	–1.18
Freshman Fall	2.65	1.11	0–4.0	–.22	–1.17
Freshman Spring	2.71	1.07	0–4.0	–.22	–1.09
Sophomore Fall	2.68	1.10	0–4.0	–.23	–1.19
Sophomore Spring	2.58	1.13	0–4.0	–.12	–1.24

^aThese values are averages of items asking the number of times a student engaged in an activity.

^bValues reflect the average of two items on the # hours spent engaged in academic activities. Likert scale where 0 = 0 hours; 1 = 1–5 hours; 2 = 6–10 hours; 3 = 11–20 hours; 4 = more than 20 hours.

^cValues reflect one item on the # of hours spent with friends. Likert scale where 0 = 0 hours; 1 = 1–5 hours; 2 = 6–10 hours; 3 = 11–20 hours; 4 = more than 20 hours.

Table 3
Estimates for Academic and Social Motives/Behaviors and Alcohol Use by Gender and Family History

Parameter	Men			Women		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
AcMB1 → AlcUse1	-.09	.04	-.06	-.03	.04	-.02
AcMB2 → AlcUse2	-.04	.03	-.03	-.09	.03	-.06
AcMB3 → AlcUse3	-.02	.03	-.02	-.14	.03	-.09
AcMB4 → AlcUse4	-.05	.03	-.04	-.12	.03	-.09
AcMB5 → AlcUse5	-.02	.03	-.02	-.11	.03	-.09
SocMB1 → AlcUse1	.31	.04	.22	.23	.03	.18
SocMB2 → AlcUse2	.42	.04	.27	.41	.03	.31
SocMB3 → AlcUse3	.37	.04	.22	.41	.03	.29
SocMB4 → AlcUse4	.38	.04	.23	.38	.03	.28
SocMB5 → AlcUse5	.44	.05	.27	.39	.03	.28
	FamHx Pos			FamHx Neg		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
AcMB1 → AlcUse1	-.04	.06	-.03	-.07	.03	-.05
AcMB2 → AlcUse2	-.08	.05	-.06	-.06	.02	-.05
AcMB3 → AlcUse3	-.04	.04	-.03	-.08	.02	-.06
AcMB4 → AlcUse4	-.16	.05	-.12	-.06	.02	-.05
AcMB5 → AlcUse5	-.09	.05	-.07	-.05	.02	-.05
SocMB1 → AlcUse1	.36	.06	.23	.23	.03	.19
SocMB2 → AlcUse2	.52	.06	.32	.38	.03	.29
SocMB3 → AlcUse3	.46	.06	.28	.38	.03	.26
SocMB4 → AlcUse4	.50	.05	.32	.34	.03	.24
SocMB5 → AlcUse5	.58	.07	.34	.35	.03	.25

Note. AcMB = Academic Motives/Behaviors; SocMB = Social Motives/Behaviors; AlcUse = Alcohol Use; FamHx Pos = Family History Positive; FamHx Neg = Family History Negative.

Table 4
Estimates for Academic and Social Motives/Behaviors and Alcohol Use by Race/Ethnicity and Total Sample

Parameter	Caucasian			Latino			Asian			Total		
	b	SE	β	b	SE	β	b	SE	β	b	SE	β
AcMB1 $\rightarrow$ AlcUse1	-.07	.04	-.04	-.09	.08	-.06	-.04	.04	-.05	-.06	.02	-.04
AcMB2 $\rightarrow$ AlcUse2	-.06	.03	-.04	-.10	.06	-.08	-.05	.04	.05	-.06	.02	-.05
AcMB3 $\rightarrow$ AlcUse3	-.06	.03	-.04	-.07	.06	-.06	-.09	.04	-.09	-.08	.02	-.06
AcMB4 $\rightarrow$ AlcUse4	-.09	.03	-.07	-.17	.05	-.16	-.03	.03	-.03	-.08	.02	-.06
AcMB5 $\rightarrow$ AlcUse5	-.08	.03	-.06	-.04	.06	-.03	-.05	.03	-.06	-.05	.02	-.04
SocMB1 $\rightarrow$ AlcUse1	.33	.04	.22	.29	.07	.22	.13	.04	.17	.25	.02	.20
SocMB2 $\rightarrow$ AlcUse2	.51	.03	.34	.35	.06	.28	.21	.04	.20	.40	.02	.30
SocMB3 $\rightarrow$ AlcUse3	.46	.03	.28	.43	.06	.34	.25	.04	.21	.04	.02	.27
SocMB4 $\rightarrow$ AlcUse4	.45	.03	.28	.42	.06	.32	.26	.04	.23	.39	.02	.27
SocMB5 $\rightarrow$ AlcUse5	.51	.04	.31	.38	.06	.31	.22	.04	.20	.40	.03	.28

Note. AcMB = Academic Motives/Behaviors; SocMB = Social Motives/Behaviors; AlcUse = Alcohol Use.

Table 5
Estimates for Academic and Social Motives/Behaviors and Alcohol-Related Problems by Gender and Family History

Parameter	Men		Women	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
AcMB1 → RAPI1	-.05	.02	-.08	.02
AcMB2 → RAPI2	-.05	.02	-.09	.02
AcMB3 → RAPI3	-.04	.02	-.07	.02
AcMB4 → RAPI4	-.01	.02	-.03	.02
AcMB5 → RAPI5	-.05	.02	-.10	.02
SocMB1 → RAPI1	.02	.02	.03	.02
SocMB2 → RAPI2	.02	.02	.04	.02
SocMB3 → RAPI3	.03	.02	.05	.02
SocMB4 → RAPI4	.05	.02	.08	.02
SocMB5 → RAPI5	.05	.03	.08	.02

	FamHx Pos		FamHx Neg	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
AcMB1 → RAPI1	-.04	.02	-.06	.01
AcMB2 → RAPI2	-.05	.02	-.09	.01
AcMB3 → RAPI3	-.06	.02	-.11	.01
AcMB4 → RAPI4	-.06	.02	-.11	.01
AcMB5 → RAPI5	-.07	.02	-.13	.01
SocMB1 → RAPI1	.03	.03	.05	.02
SocMB2 → RAPI2	.01	.03	.01	.02
SocMB3 → RAPI3	.06	.03	.10	.02
SocMB4 → RAPI4	.03	.03	.04	.02
SocMB5 → RAPI5	.03	.03	.05	.02

Note. AcMB = Academic Motives/Behaviors; SocMB = Social Motives/Behaviors; RAPI = Rutgers Alcohol Problem Index; FamHx Pos = Family History Positive; FamHx Neg = Family History Negative.

Table 6
Estimates for Academic and Social Motives/Behaviors and Alcohol-Related Problems by Race/Ethnicity

Parameter	Caucasian			Latino			Asian			Total		
	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β	<i>b</i>	<i>SE</i>	β
AcMB1 $\rightarrow$ RAPI1	-.03	.02	-.04	-.07	.03	-.10	-.05	.03	-.09	-.05	.01	-.07
AcMB2 $\rightarrow$ RAPI2	-.04	.02	-.06	-.13	.03	-.22	-.08	.03	-.15	-.06	.01	-.10
AcMB3 $\rightarrow$ RAPI3	-.05	.01	-.09	-.10	.02	-.18	.01	.03	.01	-.05	.01	-.10
AcMB4 $\rightarrow$ RAPI4	-.07	.02	-.12	-.03	.03	-.06	-.09	.02	-.18	-.07	.01	-.13
AcMB5 $\rightarrow$ RAPI5	-.06	.02	-.12	-.12	.03	-.20	-.07	.03	-.15	-.07	.01	-.14
SocMB1 $\rightarrow$ RAPI1	.02	.02	.04	.00	.03	.00	.02	.03	.04	.02	.01	.03
SocMB2 $\rightarrow$ RAPI2	.03	.02	.05	.01	.03	.01	.09	.03	.17	.04	.01	.07
SocMB3 $\rightarrow$ RAPI3	.06	.02	.10	.05	.03	.09	.03	.03	.05	.07	.01	.11
SocMB4 $\rightarrow$ RAPI4	.06	.02	.11	.05	.03	.09	.01	.03	.02	.06	.01	.10
SocMB5 $\rightarrow$ RAPI5	.05	.02	.08	.02	.03	.03	.07	.03	.11	.05	.01	.09

Note. AcMB = Academic Motives/Behaviors; SocMB = Social Motives/Behaviors; RAPI = Rutgers Alcohol Problem Index.