Parental and Peer Influences on Alcohol Use during the Transition out of College

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Abstract

Parental and peer drinking and attitudes have been identified as predictors of drinking during adolescence and the transition to college, but little is known about these influences during the transition out of college. The current study assessed the influence of parents and peers on drinking behavior in a large sample of college drinkers (N=1,665), using a cross-lagged panel SEM model across three time-points: final year of college and annually for the following two years. Multigroup models were tested for Caucasian compared to Hispanic, and Asian American students to determine if parental and peer influences operated similarly for these groups. Results in the full sample indicated that peer selection effects were present both during the initial transition out of college and between one year and two years post-college. Although peer socialization effects were not present during the initial transition out of college, there was evidence of peer socialization from one year post-college to two years post-college. During the initial transition out of college direct effects of familial drinking on student drinking were evident, whereas family drinking indirectly impacted student drinking through peer selection from one year to two years post-college. Multigroup analyses identified group differences only between one and two years post college. During this time period, peer selection and family effects on peer selection were evident among ethnic minority students but not among Caucasian students.

Despite a general reduction in alcohol use among adolescents and young adults over the past decade, heavy alcohol use remains a serious problem, particularly in college populations where heavy episodic or binge drinking is especially prevalent (Johnston, O'Malley, Bachman, & Schulenberg, 2013). The consequences due to excessive alcohol consumption are dramatic, and include personal, institutional, and societal costs (Harwood, 1981). Over half of all traffic related deaths among persons aged 18-24 involve alcohol, and roughly 2,000 college students die each year from both traffic and non-traffic alcohol related injuries (Hingson, Zha, & Weitzman, 2009). Prevalence rates of alcohol use disorders are also high during this developmental period, with 31% of students meeting diagnostic criteria for alcohol abuse and roughly 6% meeting criteria for dependence (Knight et al., 2002).

Although many college students report problems due to alcohol use, studies have demonstrated high rates of recovery from heavy drinking in this population following the

transition out of college (Dawson, Grant, Stinson, & Chou, 2006; Tucker, 2003; Watson & Sher, 1998). This recovery process, commonly referred to as "maturing out," suggests a developmental trend of alcohol use that peaks during late adolescence and rapidly declines as students enter adulthood (Jochman & Fromme, 2010). This process is believed to be the result of young adults taking on more adult roles and responsibilities, including marriage, having children of their own, and joining the workforce (Bachman et al., 2002); however, other research suggests that changes in personality, rather than social roles, account for the maturing out of alcohol use (Littlefield, Sher, & Wood, 2009). The adoption of adult roles may result in a reduction of alcohol use directly, as a result of role socialization, or indirectly as a result of role selection (Kandel, 1980). Changes in social relationships other than marriage may also impact the process of maturing out. Research on drinking behavior during the transition from high school to college indicates that both parental and peer influences play a role in the remarkable increase in drinking during this period, with peers generally serving as a risk factor and parents generally serving as a protective factor (e.g., Wetherill & Fromme, 2007). However, little is known about the impact of these social factors as students graduate from college and take on more adult responsibilities. While maturing out of problematic drinking may be a normative process for college students, many individuals continue to consume alcohol at high levels following their transition from the college environment (Jackson, Sher, Gotham, & Wood, 2001). It is these individuals who are at greatest risk for the development and maintenance of alcohol use disorders throughout adulthood. Therefore, it is critical to identify potential risk and protective factors for problematic drinking as students leave college.

Although numerous factors contribute to learning experiences about alcohol, as the primary means of socialization of children, parents are the strongest influence on their children's attitudes towards drinking (Jackson, Henriksen, & Dickinson, 1999). As children age and transition into adolescence, the direct influence of parents wanes, and peers become increasingly influential (Windle, 2000). However, the direct influence of parents remains strong throughout adolescence and into emerging adulthood (Wetherill & Fromme, 2007). Parental drinking habits and attitudes towards alcohol have been found to directly predict drinking during adolescence and the transition into college (Turrisi, Jaccard, Taki, Dunnam, & Grimes, 2001). While parenting factors, such as monitoring and communication, have been linked to alcohol use throughout adolescence and emerging adulthood, the extent to which parents and other family members consume alcohol themselves also impacts the drinking habits of their offspring. Considerable research has demonstrated the impact of a positive family history of alcohol problems on the development of alcohol use disorders (Pandina & Johnson, 1990; Schuckit & Smith, 2000). Parents may also influence the drinking behavior of their offspring indirectly, through peer group selection. Indeed, parents have been found to protect their children and adolescents from drinking and other undesirable behaviors by discouraging their association with peer groups that engage in these types of behaviors (Abar & Turrisi, 2008; Simons-Morton & Farhat, 2010; Wood, Read, Mitchell, & Brand, 2004). This indirect effect of families may continue to provide a protective effect on drinking behavior later in life as offspring transition into more adult roles.

Beyond the continued influence of parents, peers also exert a significant influence on drinking behavior in college. Whereas young people do not select their parents, both peer selection and socialization processes affect college students' alcohol use. There is considerable evidence that heavier drinkers select into heavier drinking peer groups (Stappenbeck et al., 2010) and that perceptions of peer alcohol use (e.g. descriptive norms) are robust predictors of drinking behavior (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, Haines, & Rice, 2005).

Upon graduation from college, many students experience an abrupt change in their peer group; however, they may select peer groups with similar drinking histories and behaviors following graduation. Even though the graduate is no longer a part of a college environment that is often associated with heavy drinking, socialization may continue through these new peer groups. The current study examined both peer selection and socialization effects during the two years following college graduation. We hypothesized that both peer selection and socialization effects would be present during the first years after college life. We also expected to find family socialization effects during the initial transition out of college. For many students, the transition from college to more adult responsibilities is a gradual process. It is common, for instance, for students to return to live with their parents following college graduation (Danziger & Ratner, 2010; Stone, Van Horn, & Zukin, 2012; Toguchi, Kim, Uno, Mortimer & O'Brien, 2011). Even among children who do not re-enter their parent's homes, parents and other adult family members may play an important role in students' adjustment to post-collegiate life. Whereas previous research has examined the impact of various parenting factors (e.g., monitoring and communication), the current study focuses on the influence of familial alcohol use on participant drinking behavior. Consistent with previous research, we hypothesized that familial drinking would impact the drinking behavior of college graduates both directly (via modeling) and indirectly through peer group selection. We anticipated that these effects would be most pronounced during the initial transition out of college, a time during which parents may play an integral role in facilitating adjustment to post-college life.

Despite prior research demonstrating substantial racial/ethnic group differences in parental and peer influences during adolescence and emerging adulthood (Bersamin, Paschall, & Flewelling, 2005; Ellickson & Morton, 1999), prior studies of "maturing out" have given little attention to racial/ethnic group differences. Across development, prevalence of alcohol use and its related problems vary across cultural groups living in the United States (Paschall & Flewelling, 2002). Among emerging adults, previous research has suggested that both peer socialization and selection effects are stronger among Caucasian students (Stappenbeck, et al., 2010), whereas family influences may be more important for Hispanic and Asian American students (Vaughan, Corbin, & Fromme, 2009). Thus, we examined ethnic group differences in the relative influences of parents and peers on drinking behavior during the transition out of college; that is, in the final year of college and yearly for the next two years. Consistent with previous research, we expected that peer selection and socialization effects would be more pronounced among Caucasian students relative to ethnic minority (Asian and Latino/Hispanic) students, and that family influences would be less pronounced for Caucasian students, but more influential for Asian and Latino/Hispanic students.

Method

Participants

Participants were members of the 2004 entering class of a large, public, southwestern university who participated in a longitudinal study of alcohol use and other behavioral risks during and beyond the transition from high school to college. The current study utilized participants from three cohorts of the study. The largest cohort (n = 2245 with complete data in the summer before matriculation) consisted of students who were tracked bi-annually throughout the course of the study. A second cohort (n = 694 with complete data in the summer before matriculation) consisted of students who were recruited at the onset of the study and completed baseline assessments, as well as annual assessments at years 4 (senior year of college), 5, and 6 (the three time points utilized in the current study). The final cohort (n = 421 with complete data in senior year of college) consisted of a subgroup of students who completed their first assessment during year 4 of the larger study and were followed up in years 5 and 6. The latter two samples were included to examine the effects of repeated assessments on reported engagement in alcohol use and other risk behaviors. The total sample from the three cohorts comprised 3360 (60% female) participants with complete data at the first wave of data collection. Approximately half of the sample identified as Caucasian (54.2%), with 18% identifying as Asian, 15.6% as Hispanic/Latino(a), 3.4% as Black/African American, 0.4% as Native Hawaiian/Pacific Islander, 0.1% as American Indian/Alaskan Native, and 6.5% as multi-ethnic. The sample characteristics, in terms of gender and ethnicity, were similar to the overall enrollment characteristics of the university during the 2004-2005 academic year (Caucasian 58.6%, Asian 14.3%, Hispanic/Latino(a) 13.4%, African American 3.5%).

The current study utilized data from the final three assessments, which correspond to the fall semester of the senior year of college, one year post-graduation, and two years post-graduation. A total of 2,386 participants (71% of the original sample) were eligible for these analyses based on completion of the senior year of college survey. We also restricted the sample to Caucasian, Hispanic/Latino, and Asian students as other groups were not of sufficient size to allow for group comparisons. To clearly capture changes in drinking behavior during the transition out of college, we further restricted the sample to only participants who reported graduation following the spring semester of their fourth year in college. The resulting sample for analysis was 1,665 (69.7% of the sample with valid data in year 4; Caucasian = 1,014; Asian = 365; Hispanic = 286). Independent samples t-tests comparing four-year graduates included in the final sample to those who graduated after four years of undergraduate study revealed that the two groups did not differ significantly on any key variables, including typical drinking behavior (frequency of binge drinking and drinking to intoxication), perceptions of peer group drinking, or family drinking.

Measures

Alcohol use—Participant alcohol use was assessed using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Participants indicated the number of standard drinks that they consumed on each day of a typical week. A standard drink was defined as 12 oz. of beer, 5 oz. of wine, or 1.5 ounces of distilled spirits straight or in a

mixed drink. From the DDQ, composite scores were generated for each participant based on the number of drinking days during a typical week, and quantity of drinks consumed on a typical drinking day. Two additional questions were used to assess heavy episodic drinking and drinking to intoxication. Heavy episodic drinking, or binge drinking, was assessed by asking participants to indicate on how many days during the past three months they consumed 5 or more drinks (4 or more drinks for women) during a single drinking occasion. The second question asked participants to specify the number of days during the past three months that they felt intoxicated from drinking alcohol. A latent variable for drinking behavior was created for each time point based on these four indicator variables.

Family Drinking—During each assessment period, participants were asked to report on the drinking behavior of their immediate family members (parents and siblings), as well as maternal and paternal grandparents using the Family Tree Questionnaire (Mann, Sobell, Sobell, & Pavan, 1985). Participants rated each family member using the following four-point scale: 1 = Does not drink; 2 = Social/Non-problem drinker; 3 = Possible problem drinker; 4 = Definite problem drinker. In the current study, only scores for parents and grandparents were used to ensure that only adult relatives (over the age of 21) were used to assess family drinking. A composite family drinking density variable was created by dividing the number of definite or possible problem drinkers in each family by the total number of adult family members on which the participant reported.

Perceptions of Peer Group Drinking—In all three surveys, participant's social-group descriptive norms were assessed using a modified version of the Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991). Similar to the DDQ, the DNRF asked participants to estimate the number of standard drinks that members of their social group (i.e., "the principle group of friends with whom you interacted and spent time with") consumed on each day during a typical week in the past 3 months. Estimates of social-group members' alcohol consumption were created by summing the quantity consumed for each day of the week, yielding an index of average weekly consumption.

Data Analytic Plan

A selection and socialization model was tested using cross-lagged panel structural equation modeling to examine relations among participants' perceptions of family and peer drinking and their own drinking behavior. The model included both autoregressive stability paths (e.g. from senior year drinking to drinking one year following graduation and from one year post-graduation drinking to drinking at two-years following graduation), and cross-lagged paths representing selection (e.g. paths from personal alcohol use to perceived drinking by members of the individual's social group across each time lag), and socialization (e.g. paths from social-group descriptive norms to alcohol use across each time lag). Family drinking was hypothesized to have both direct socialization effects on student drinking, as well as indirect effects operating through peer selection (e.g. social-group descriptive norms). Goodness of model fit was evaluated using the following criteria: CFI > .90 (Bentler, 1990); RMSEA < .08 (Browne & Cudeck, 1992); and SRMR < .08 (Hu & Bentler, 1999).

Multigroup models were also tested to determine if parental and peer effects operated similarly across the three ethnic groups. First, we conducted a multigroup confirmatory factor analysis (CFA) to assess measurement invariance of the latent drinking construct across the three ethnic groups using Mplus version 5 (Muthén & Muthén, 2007). Measurement invariance was assessed through confirmatory factor analysis using multiple group covariance structure analysis, according to recommendations by Meredith (1993) and Chen & West (2008), and procedures outlined by Geiser, Crayen, and Enders (2014). Models with more restrictions are compared to less restricted models using likelihood ratio tests and by comparing fit indices. We first constrained the factor loadings followed by the latent variable intercepts. The multigroup analytic procedures require a minimum sample size of $n = 10$ per indicator variable (Kline, 2011). Based on this criterion, sufficient samples sizes were available for Caucasian ($n = 1,014$), Asian ($n = 365$), and Hispanic ($n = 286$) students, resulting in a total sample size of 1,665 (1,023 female) participants.

After confirming measurement invariance by ethnicity, multigroup models were conducted to examine potential ethnic group differences in the structural paths of interest. We used an iterative process of placing constraints on equivalent paths in a stepwise manner. Having already placed constraints on the measurement model, we next placed constraints on the correlations and autoregressive paths across the different ethnic groups. Correlations and autoregressive paths that were significantly different between the two groups were allowed to be freely estimated. A partially invariant model was then utilized as the new baseline model for comparison against a new model that additionally constrained the cross-lagged paths assessing selection, socialization, and family effects. To the extent that there was a decrement in model fit when constraining the cross-lagged paths, we followed up with contrasts for individual parameters to determine the specific cross-lagged paths that differed by racial/ethnic group. Results for each model are described in detail below.

Results

Results of the model within the combined sample (all ethnic groups) examining family, peer selection, and peer socialization effects on drinking during the transition out of college indicated a good overall fit to the data, $\chi^2(62) = 558.38$, $p < .001$, CFI = .966, RMSEA = .069, SRMR = .049 (see Figure 1). Selection effects were significant across both waves of data. Participants who reported greater alcohol consumption during senior year of college selected peer groups they perceived to be heavy drinkers one year following college ($\beta = 0.173$, $p = .02$), with a comparable pattern of results from one-year to two-years post-graduation ($\beta = 0.182$, $p = .01$). Regarding socialization, perceived peer group drinking behavior during senior year of college did not significantly predict participant drinking behavior one year following the transition out of college ($\beta = 0.097$, $p = .175$). Peer socialization effects were present one year later. Social groups formed one year post-college had a significant influence on participant drinking during the following year, with peer groups perceived as heavy drinkers predicting greater alcohol consumption ($\beta = 0.228$, $p = .001$).

Family effects were assessed both directly, and indirectly, through peer group selection. During the immediate transition out of college, family members directly influenced

participant drinking, with reduced consumption occurring among participants with lighter drinking family members ($\beta = 0.058$, $p = .050$). While family drinking behavior served as a direct protective factor against heavy drinking during the immediate transition out of college, this effect was not maintained one year later ($\beta = -0.001$, $p = .966$). However, families remained influential through peer group selection. Participants from lighter drinking families at time two selected peer groups that they perceived as comprising light drinkers at time three ($\beta = 0.063$, $p = .018$). Family effects on peer group selection were not significant during the immediate transition out of college ($\beta = 0.033$, $p = .160$).

Multigroup Models

We initially tested multi-group measurement and structural models across the three ethnic groups (Caucasian, Asian, Latino). In these models, the group differences that emerged were predominantly between Caucasian and non-Caucasian (Asian and Latino) participants. Although Asian and Hispanic participants differed in terms of both their typical drinking habits and their perceptions of the drinking behaviors of their peer groups (see Table 1), familial and peer selection and socialization effects were statistically equivalent across these two groups. Indeed, when all paths in the model were constrained to equivalence between the Asian and Hispanic groups, the decrement in model fit was not significantly significant, $\chi^2(59) = 16.813$, $p = .999$. Given the greater statistical power and ease of interpretation when the non-Caucasian participants were combined, all multi-group models presented in the text involved a dichotomous grouping variable (Caucasian vs. non-Caucasian).

Invariance of the measurement model (latent drinking variable) was assessed across the two groups using the multi-group procedure in Mplus version 5 (Muthen & Muthen, 2007). Based on recommendations by Chen (2007) measurement invariance is established after examining the change in several fit indices from more to less constrained models. Measurement invariance at the level of the intercepts is upheld if the decrease in CFI is less than .005 and the increase in RMSEA is less than .01, or the increase in SRMR is less than .005. Results of the multi-group confirmatory factor analysis indicated that the factor structure, loadings, and intercepts were invariant across the two groups, $\chi^2(42) = 71.66$, $p = .003$ (CFI = .006; RMSEA = .004; SRMR = .001). Measurement invariance of the latent participant drinking variable was also assessed across the three racial/ethnic groups. Results of the three group model assessing measurement invariance were consistent with the two group model, indicating invariance in the factor loadings and intercepts.

Following the results of the multigroup CFA, a baseline model (Model 1) was established by placing constraints on the factor loadings and intercepts of the latent variables. Results of the baseline model indicated an adequate fit to the data, $\chi^2(160) = 917.838$, $p < .001$, CFI = .951, RMSEA = .075, SRMR = .055. Since the present study is primarily focused on the influence of peer group selection and socialization, and family influences on drinking behavior, we next constrained the autoregressive stability paths and correlations among the measured and latent variables to create a final baseline model before constraining the primary paths of interest (e.g. cross-lagged paths). The new model with constrained correlations and autoregressive paths (Model 2) was compared to Model 1 (constrained measurement parameters). Results from Model 2 suggested adequate fit to the data, $\chi^2(174)$

= 1016.111, $p < .001$, CFI = .945, RMSEA = .076, SRMR = .065, though there was a significant decrement in fit compared to Model 1, $\chi^2(14) = 201.585$, $p < .001$. To identify the parameters responsible for the decrement in model fit, correlations and autoregressive paths were compared between the two groups using Wald tests. Corresponding paths in the two groups with significant Wald tests were then freely estimated to create a partially invariant model. A total of two correlations and two autoregressive paths were freely estimated within each of the ethnic groups. Freely estimated correlations included participant drinking with social group descriptive norms at time one and time two. All other correlations were constrained across the two ethnic groups. The perceptions of peer group drinking stability path from time two to time three, and the participant drinking path from time one to time two were also freely estimated, while all other autoregressive paths were constrained across the two groups. The partially invariant Model 2 indicated a good overall fit to the data, $\chi^2(172) = 938.523$, $p < .001$, CFI = .950, RMSEA = .073, SRMR = .057. A chi-square difference test comparing the partially invariant Model 2 to Model 1 indicated that there was not a significant decrement in model fit, $\chi^2(12) = 15.262$, $p = .110$. Next, constraints were placed on the crossed-lagged paths (representing peer selection, peer socialization, and both direct and indirect family effects), to ascertain whether these paths differed across the two groups (Model 3). Results from Model 3 indicated adequate fit to the data, $\chi^2(181) = 1023.323$, $p < .001$, CFI = .945, RMSEA = .075, SRMR = .066, but there was a significant decrement in model fit compared to Model 2, $\chi^2(9) = 84.8$, p < .001. To determine the specific parameters that differed by group, individual cross-lagged paths were compared between the two groups using Wald tests. Paths that resulted in significant Wald tests were freely estimated in Model 4, whereas, non-significant paths were constrained. Results of Model 4 indicated an adequate fit, $\chi^2(177) = 956.79$, $p < .001$, CFI = .949, RMSEA = .073, SRMR = .058. The results of the final model are described in detail below (see Figure 2 and Figure 3 for path diagrams for each group).

Ethnic Group Differences in Selection, Socialization, and Family Effects

Peer group selection—Selection effects were evident among both Caucasian and non-Caucasian participants during the immediate transition from college, (Caucasian: $\beta = .205$, $p = .009$; Non-Caucasian: $\beta = .157$, $p = .009$), and these effects did not differ significantly between the two groups (Wald $\chi^2 = 0.034$, $p = .853$). Across both samples, participants who engaged in heavier drinking practices during college selected into peer groups they perceived to be heavy drinkers during the transition from college. While selection effects remained significant one year later within the non-Caucasian sample ($\beta = 0.271$, $p = .001$), they were not significant within the Caucasian sample ($\beta = 0.067$, $p = .489$). Selection effects from time 2 to time 3 were significantly stronger for the minority sample compared to the Caucasian sample (Wald $\chi^2 = 4.764$, $p = .029$).

Peer group socialization—Socialization effects were not significant for either ethnic group during the immediate transition out of college (Caucasian: $\beta = 0.070$, $p = .291$; Non-Caucasian: $\beta = 0.089$, $p = .291$), and this socialization effect did not differ by group (Wald $\chi^2 = 1.991$, $p = .158$). Socialization effects were significant for both groups across the second wave of data (Caucasian: $\beta = .167$, $p = .006$; Non-Caucasian: $\beta = .189$, $p = .006$), with no significant differences indicated between the two groups (Wald $\chi^2 = 1.4$, $p = .237$).

Students with peer groups they perceived as comprising heavy drinkers one year after graduation drank more heavily one year later.

Direct family effects—The direct effect of family alcohol use on participant drinking was not significant at either time point for either group; however, the effect approached significance during the immediate transition from college for both groups (Caucasian: $\beta = .052$, $p = .051$; Non-Caucasian: $\beta = .059$, $p = .051$). The strength of the direct family effect on drinking behavior did not differ between Caucasian and non-Caucasian students (Wald $\chi^2 = .006$, $p = .939$).

Indirect family effects—As noted previously, family members may influence the drinking habits of emerging adults directly or indirectly, through peer group selection. Results from the multigroup sample indicated that that this indirect effect of families on peer group selection was not significant during the immediate transition from college for either Caucasian or non-Caucasian participants (Caucasian: $\beta = .052$, $p = .191$; Non-Caucasian: $\beta = .029$, $p = .191$). However, an indirect effect of families on peer group selection was evident one year later for the non-Caucasian participants only (Caucasian: $\beta = .027$, $p = .413$; Non-Caucasian: $\beta = .129$, $p = .009$), and this effect was significantly stronger among the non-Caucasian participants (Wald $\chi^2 = 4.55$, $p = .033$). Among non-Caucasian participants, lighter drinking families were associated with the selection of peer groups who were perceived to be lighter drinkers.

Discussion

Previous research has suggested that a reciprocal relationship exists between alcohol use and social influences during the transition into college (Capone, Wood, Borsari, & Laird, 2007; Read, Wood, Davidoff, McLacken, & Campbell, 2002; Stappenbeck et al., 2010), but little is known about these processes as students transition out of college. Thus, the current study examined a selection and socialization model of parental and peer influences on alcohol use during senior year of college and the two years following. Multigroup analyses were also conducted to examine the extent to which these processes might operate differently across ethnic groups.

Consistent with study hypotheses, peer selection effects were evident during the immediate transition out of college, and remained significant one year later. Students selected peer groups that they perceived to have similar drinking habits after graduating from college, and continued to associate with similar drinking peers one year later. Contrary to study hypotheses, socialization effects were not immediately evident as students graduated from college, suggesting that the peer group that one associates with during college does not continue to exert an influence on one's personal drinking behavior once they leave the college environment. Socialization effects, however, were significant one year after college graduation, suggesting that the newly formed peer groups selected after college subsequently influence drinking behavior.

The current study also examined familial influences on student drinking as students transitioned out of the college environment. Parents may influence the drinking behavior of

their children both directly and indirectly, through peer group selection (Walls, Fairlie, & Wood, 2009). Consistent with this hypothesis, the results demonstrated that the drinking habits of family members during senior year of college directly influenced participant drinking one year later. Students from lighter drinking families during senior year of college consumed less alcohol one year later, relative to participants from heavier drinking families. Although the direct effect of families was not evident one year later, families continued to influence participant drinking indirectly, though peer group selection. One year after college graduation, participants from lighter drinking families selected peer groups who they perceived as drinking less, relative to participants from heavier drinking families.

Within our ethnically diverse sample, we found that selection, socialization, and familial effects differed based on ethnicity, though these differences did not emerge until one year after the initial transition out of college. During the immediate transition out of college, peer selection effects and direct familial effects were found for both Caucasian and minority ethnic groups, consistent with the results in the full sample. After the initial transition from college, only socialization effects were significant in the Caucasian sample. In contrast, among ethnic minority participants, both selection and socialization effects were found, as well as an indirect effect of family drinking on peer group selection, suggesting that the socialization and indirect family effects found in the full sample were primarily driven by the ethnic minority groups. Among Hispanic and Asian students, those who drank more heavily after exiting college chose peer groups they perceived as drinking more heavily, and the selection of these peer groups was partially determined by familial drinking habits.

Time spent in college represents the peak period of heavy alcohol use among emerging adults. Although many students reduce or eliminate their use of alcohol following college graduation, others continue to drink at high levels putting them at heightened risk for the development of alcohol use disorders. Current results have important implications for the development and application of interventions for alcohol related problems during this developmental period. Considerable research has found that reducing discrepancies between perceived and actual peer drinking is effective in reducing alcohol consumption among college students (Larimer & Cronce, 2002). Yet results of the current study suggest that the influence of the collegiate peer group wanes as college graduates select new social networks. Heavier drinking students may choose to associate with friends they perceive as having similar drinking patterns, or career paths that encourage alcohol consumption. These new social networks further influence the drinking behavior of the graduates as they progress into adulthood. Accordingly, normative feedback based interventions delivered during college may have little long term effectiveness as students leave college. Rather, interventions that encourage the selection of lighter drinking peer groups and adult roles and careers that are not conducive to heavy drinking may be most effective during the initial transition from college.

As recent college graduates acclimate to their new social environments, normative feedback based interventions may have utility, particularly within social environments associated with heightened risk for alcohol problems. For example, normative feedback interventions might have utility with young adults in the military as well as those working in the hospitality industry (e.g. restaurants and bars). Results of the current study also suggest that the

appropriate timing of such interventions may differ based on ethnicity. Whereas Caucasian students socialized quickly into their new peer groups following college graduation, the peer groups of the ethnic minority students were less stable. Thus, interventions utilizing normative feedback may be effectively implemented soon after the transition into a new social environment for Caucasian students, whereas such approaches may be less effective for ethnic minority young adults who appear to take longer to transition into new social contexts.

Collegiate prevention and intervention programs for problematic drinking that have implemented parenting components have also shown reductions in both consumption and alcohol related consequences, highlighting the protective influence of parents during this period of heavy alcohol use (Abar & Turrisi, 2008; Turrisi et al., 2001). After leaving college, many students return to live within closer proximity of their parents (Danziger & Ratner, 2010; Stone, Van Horn, & Zukin, 2012; Toguchi Swartz, Kim, Uno, Mortimer, & Bengtson O'Brien, 2011). During this period of transition, parents may exhibit a direct effect on the drinking habits of their children. Accordingly, families may be an important target for continued intervention as emerging adults progress into early adulthood. Families may be most critical for ethnic minority groups. Although family drinking behavior influenced participant drinking directly for all ethnic groups during the immediate transition from college, the continued influence of family members one year later was only evident among the ethnic minority participants.

Several limitations must be considered when interpreting the current study findings. First, the sample consisted of undergraduate students recruited from a large public university and excluded students who did not graduate from college within four years. The decision to only use four year graduates in the sample was deliberate, as the purpose of the study was to investigate the impact of social influences on drinking behavior during the two years following graduation. Accordingly, the results of the current study cannot be extended to students who did not graduate within four years, and important group differences may exist between participants in the current study and those who take longer than four years to graduate or who leave college without graduating. The study is further limited by the use of participant reports of both family and peer alcohol use. Participants in the current study were asked to report on the drinking habits of their adult family members (parents and grandparents), and participants likely differ in their interpretation of problematic drinking behaviors. With respect to peer use, it is well established that individuals tend to overestimate the use of alcohol among their peers. Thus, it is not possible to determine if results in the current study were driven by actual peer drinking behavior or inaccurate perceptions of peer drinking behavior. In addition, we did not assess the identity of specific peers so we are unable to determine whether college and post-college peer groups are comprised of the same or different members. Furthermore, the current study did not examine parenting variables, such as communication and nurturing, which are also important predictors of drinking behavior. Although the sample used in this study is more ethnically heterogeneous than many previous studies, sample sizes for African-American and multi-ethnic students were too small to include in the multigroup analyses. As noted previously, initial multigroup models included group comparisons of three ethnic groups: Caucasian, Hispanic, and Asian American students. However, given the small sample sizes for the

Hispanic and Asian American groups, power to detect significant differences between these two groups was limited. Accordingly the decision was made to combine Hispanic and Asian American participants in order to preserve power. Although the structural paths were largely invariant across these two groups, one structural path was significantly different. Within the Asian American sample, a direct effect of familial drinking on participant drinking was evident one year after college graduation, whereas this effect was not significant within the Hispanic sample. Future research using larger samples of ethnic minority participants is necessary to adequately test group differences among these and other ethnic minority groups.

To our knowledge, the current study is the first to examine the continued influence of families on the drinking behavior of adult children during the transition from college. Although significant effects of family drinking were indicated, the results were limited by the measurement of the family drinking variable. Given the significance of families indicated in the current study, future research should examine the influence of additional family variables during this developmental period, including parental monitoring and attitudes towards drinking, as well as parent-child communication and parental support. Although it will be important to expand upon the examination of family variables, the current study highlights the continued influence of families on the drinking habits of their adult children as they exit college and progress further into adulthood.

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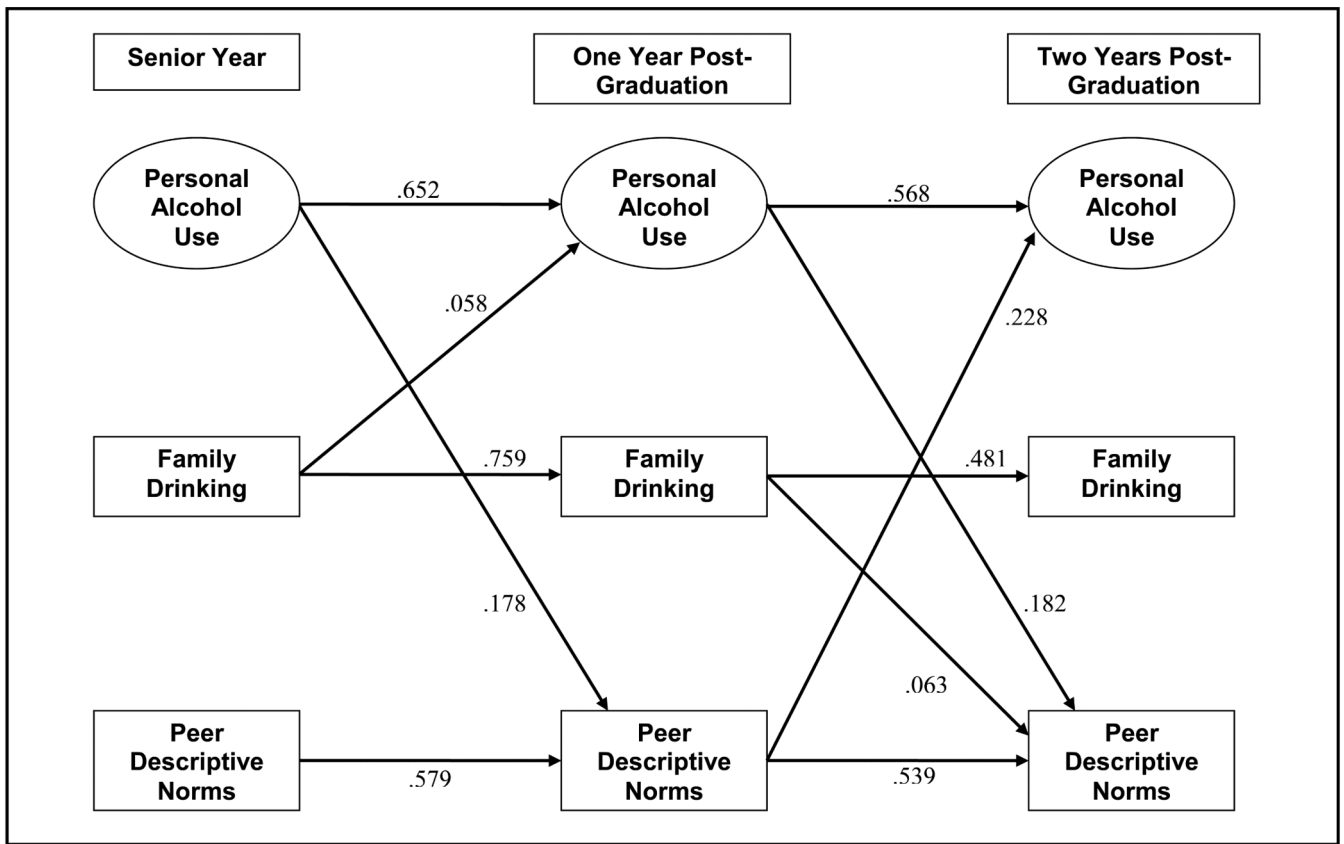
Figure 1.
Cross-lagged panel SEM path diagram for entire sample (N = 1,665). Values are standardized loadings. All paths *p* < .05.
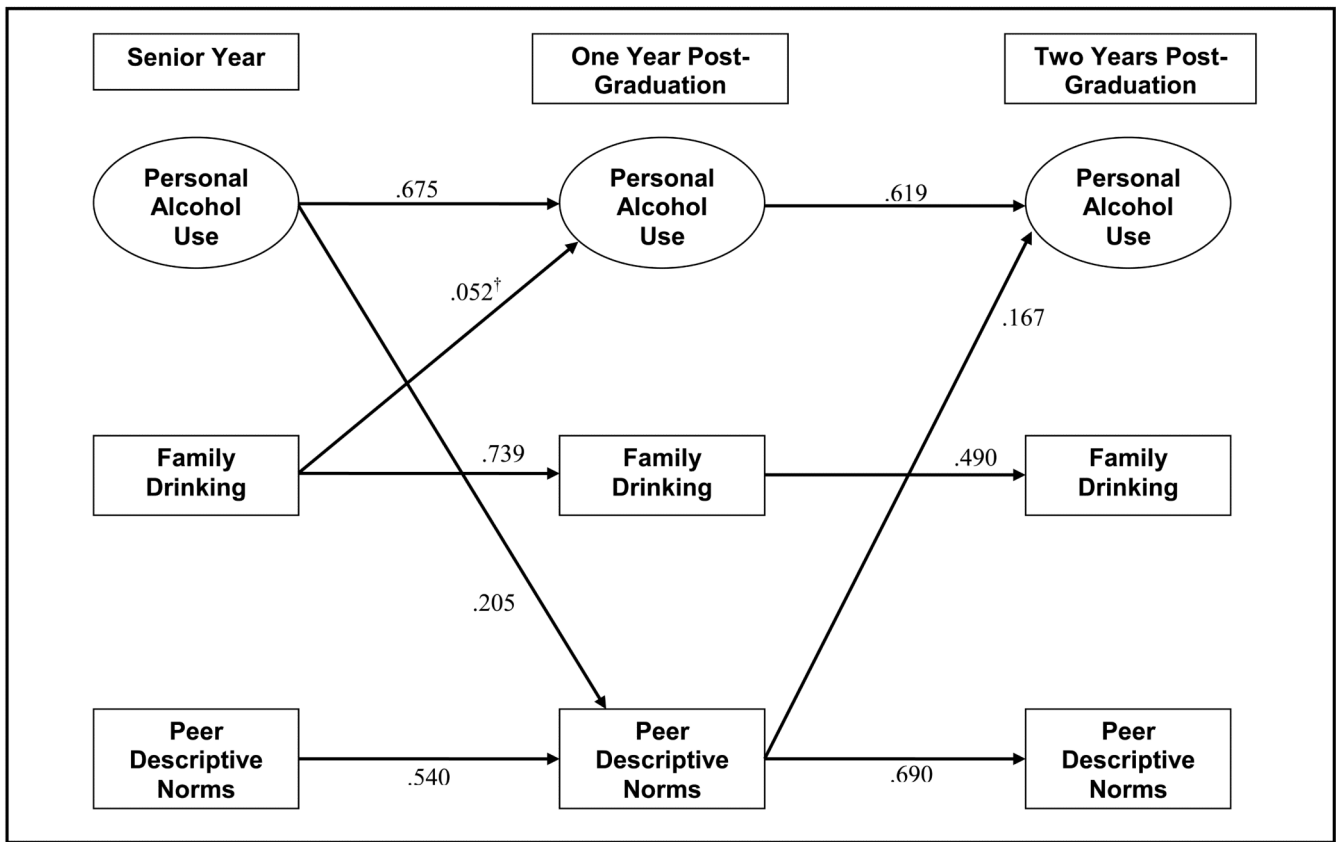
Figure 2.
Cross-lagged panel SEM path diagram for Caucasian sample (N = 1,014), showing significant paths (p < .05; †p = .051). Values are standardized loadings.
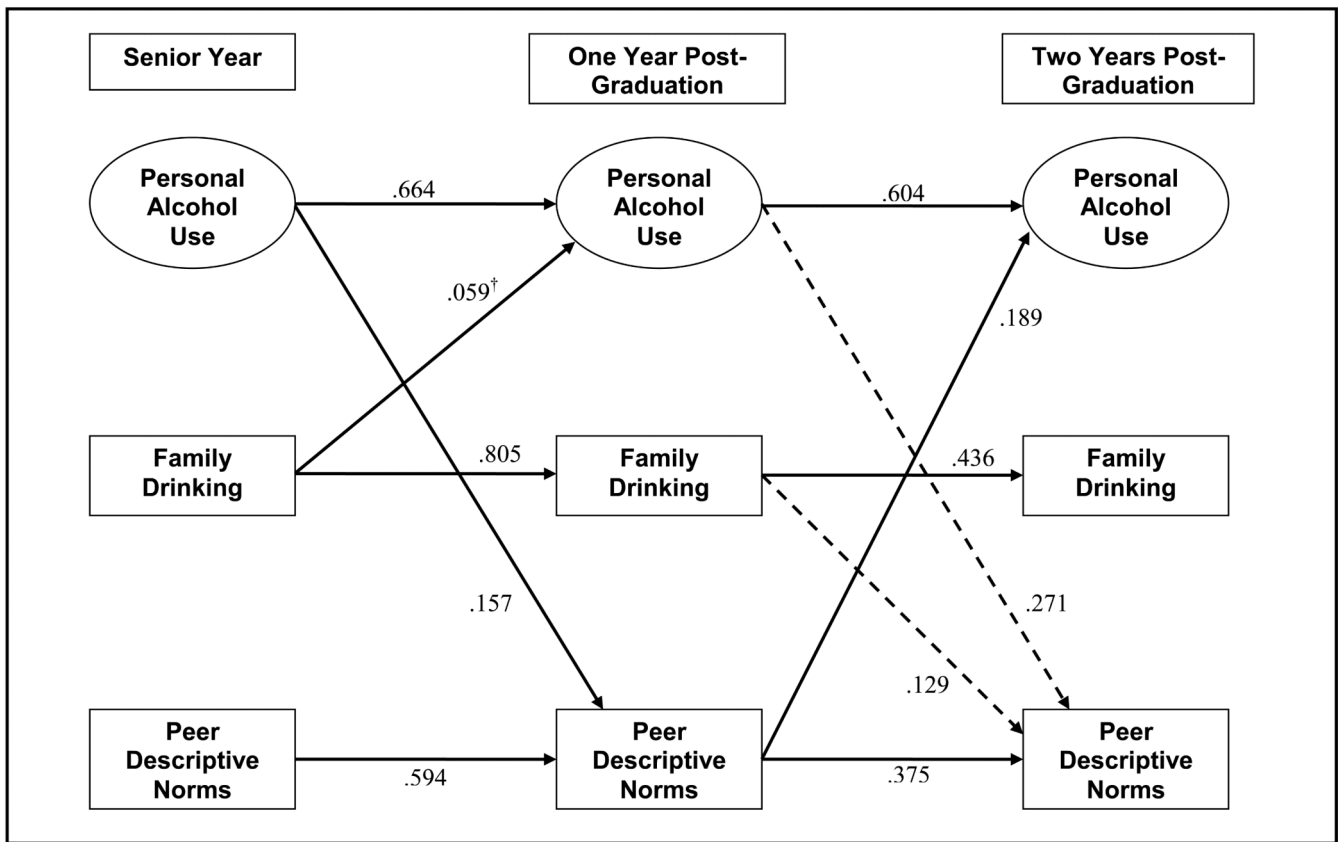
Figure 3.
Cross-lagged panel SEM path diagram for minority ethnic group sample (N = 651), showing significant paths (p < .05; †p = .051). Values are standardized loadings. Dashed line indicates significant paths for the ethnic minority sample that were not significant for the Caucasian sample.

Table 1

Means (and standard deviations) for alcohol use and social group norms by ethnicity

	Ethnicity		
	Caucasian	**Asian**	**Hispanic**
Variable	(*n*=1,014)	(*n*=365)	(*n*=286)
Total Drinks per week			
Senior	7.88 (9.66)	3.85 (6.28)	7.01 (9.23)
One year post grad	6.75 (8.22)	3.39 (5.73)	5.30 (6.88)
Two years post grad	6.56 (7.54)	2.71 (4.51)	5.11 (6.44)
Binge Drinking (past 3 months)			
Senior	5.30 (8.38)	2.16 (4.75)	4.00 (6.43)
One year post grad	4.31 (7.11)	2.29 (5.10)	3.41 (6.61)
Two years post grad	4.17 (7.24)	1.44 (3.52)	3.23 (6.22)
Drinking to Intoxication (past 3 months)			
Senior	4.72 (7.78)	1.41 (3.56)	2.91 (4.51)
One year post grad	3.72 (6.35)	1.69 (4.22)	2.15 (4.30)
Two years post grad	3.76 (7.07)	1.36 (3.11)	2.42 (4.76)
Social-group descriptive norms			
Senior	12.38 (10.21)	7.71 (9.30)	10.69 (11.02)
One year post grad	10.92 (9.58)	7.11 (8.60)	9.07 (8.22)
Two years post grad	10.71 (9.02)	6.46 (7.39)	9.01 (9.15)