

Parental Influence on Drinking Behaviors at the Transition to College: The Mediating Role of Perceived Friends' Approval of High-Risk Drinking

By: [Kelly L. Rulison](#), Edward Wahesh, [David L. Wyrick](#), & William DeJong

Rulison, K.L., Wahesh, E., Wyrick, D.L., DeJong, W. (2016). Parental influence on drinking behaviors at the transition to college: The mediating role of perceived friends' approval of high risk drinking. *Journal of Studies on Alcohol and Drugs*, 77(4): 638-648.

Made available courtesy of Alcohol Research Documentation and Rutgers University, Center of Alcohol Studies: <https://www.jsad.com/doi/abs/10.15288/jsad.2016.77.638>

Abstract:

Objective: This study tested whether perceived parental approval of high-risk drinking is directly linked to alcohol-related outcomes or whether the link between perceived parental approval and these outcomes is mediated by perceived friends' approval of high-risk drinking.

Method: In fall 2009, 1,797 incoming first-year college students (49.7% female) from 142 U.S. colleges and universities completed a web-based survey before participating in an online substance use prevention program. The analytic sample included only 18- to 20-year-old freshmen students who had consumed alcohol in the past year. Students answered questions about perceived parental approval and perceived friends' approval of high-risk drinking. They also answered questions about their alcohol use (heavy episodic drinking, risky drinking behaviors), use of self-protective strategies (to prevent drinking and driving and to moderate alcohol use), and negative alcohol-related consequences (health, academic and work, social consequences, and drinking and driving).

Results: Mediation analyses controlling for the clustering of students within schools indicated that perceived parental approval was directly associated with more easily observable outcomes (e.g., academic- and work-related consequences, drinking and driving). Perceived friends' approval significantly mediated the link between perceived parental approval and outcomes that are less easily observed (e.g., alcohol use, health consequences).

Conclusions: During the transition to college, parents may influence students' behaviors both directly (through communication) as well as indirectly (by shaping their values and whom students select as friends). Alcohol use prevention programs for students about to start college should address both parental and friend influences on alcohol use. (*J. Stud. Alcohol Drugs*, 77, 000–000, 2016)

Keywords: parental influence | behaviors | alcohol

Article:

Compared with their peers, adolescents and college students who perceive greater approval of drinking are more likely to drink and experience alcohol-related negative

consequences (Borsari & Carey, 2001, 2003; Mrug & McCay, 2013; Neighbors et al., 2007; Perkins & Wechsler, 1996). Less is known about the relative contributions of perceived approval by parents and friends on these alcohol-related outcomes immediately before the transition to college. During this transition, a convergence of factors suggests that perceived friends' approval, or peer injunctive norms, may strongly influence students' behaviors. Across adolescence and into college, students spend increasing amounts of time away from their parents (Borsari et al., 2007; Brown et al., 1997). Family influences on alcohol use weaken, whereas deviant peer influences do not (Van Ryzin et al., 2012). Furthermore, sensitivity to peer culture is heightened during this developmental period (Schulenberg & Maggs, 2002).

Even so, parents can still influence students' behavior as they transition into college. Perceived parental approval of high-risk drinking predicts students' alcohol use during the summer before college (Wood et al., 2004) and both alcohol use and alcohol-related negative consequences during their first year in college (Abar, 2012; Abar & Turrisi, 2008; Neighbors et al., 2007, 2008). The processes through which this influence occurs are less clear. Small et al. (2011) speculated that parents influence students' drinking both directly, through communication, and indirectly, by shaping students' values, life goals, and norms. In turn, these internalized values, goals, and norms may influence whom students select as friends. Indeed, parent-youth relationship quality during early adolescence is linked to deviant peer associations, which in turn shape alcohol use during early adulthood (Van Ryzin et al., 2012). Building on the need to differentiate direct and indirect parental effects, we conducted a mediational analysis to test whether perceived parental approval is directly linked to different alcohol-related outcomes (i.e., alcohol use, alcohol-related negative consequences, and selfprotective strategies) or whether perceived parental approval is indirectly linked to these outcomes through its association with perceived friends' approval.

Approval norms and alcohol use

Perceived friends' approval of high-risk drinking has been linked to alcohol use among high school graduates and college students (Kahler et al., 2003; Mrug & McCay, 2013; Neighbors et al., 2007, 2008; Wood et al., 2004), but evidence of a link between perceived parental approval of highrisk drinking and alcohol use is mixed. Perceived parental approval has been linked to alcohol use among high school students (Mrug & McCay, 2013), students attending a summer university orientation program (Wood et al., 2004), and first-year college students who were heavy drinkers (Neighbors et al., 2007, 2008). By contrast, Abar and Turrisi (2008) found that perceived parental approval before matriculation was related to students' alcohol use in their second semester of college but not their first semester. Furthermore, Kuther and Higgins-D'Alessandro (2003) found that peer norms, but not parental norms, were linked to alcohol use among first year college students, although parental norms did matter for high school juniors and college juniors. These results suggest that perceived parental approval may have a stronger impact when parents can monitor their adolescents (e.g., when adolescents live at home before college). Parental attitudes may also matter less during initial experimentation with alcohol but more once drinking habits are established.

Of note, these studies differed in several ways. For example, although most studies measured parental disapproval, Kuther and Higgins-D'Alessandro (2003) combined descriptive norms (i.e., beliefs about how much alcohol others consume) and approval norms into a single construct. Thus, it is unclear whether differences in findings across studies reflect different

populations (pre-college vs. first-year vs. older students; heavy drinkers vs. a general college population) or different measures (approval norms vs. a combined norms measure).

In the current study, we focused on students immediately before the transition to college. Because most students were living at home, we expected that parents' approval would be related to alcohol use; however, because many of these students were experimenting with alcohol use, when parental views may matter less, we expected that the link between perceived parental approval and alcohol use would be weaker than the link between perceived friends' approval and alcohol use. In addition, we expected that the link between perceived parental approval and alcohol use would be fully mediated by perceived friends' approval. This mediation could occur if parental norms and expectations shape whom students select as friends. For example, students who believe their parents disapprove of high-risk drinking may select friends who disapprove of high-risk drinking, and this disapproval from friends would then influence adolescents' alcohol use.

Approval norms and alcohol-related negative consequences

Perceptions of both friends' and parental approval of high-risk drinking have generally been linked with college students' alcohol-related negative consequences (e.g., Larimer et al., 2004). In one study of 4,000 college students at two campuses, LaBrie et al. (2010) found that perceived parental and close friends' approval norms both independently predicted alcohol problems, even after controlling for alcohol use, personal attitudes, and typical student approval norms. In another study focusing on heavy drinkers, Neighbors et al. (2007) found that perceptions of both parents' and friends' approval predicted alcohol problems, although perceived friends' approval was no longer significant after controlling for alcohol use. By contrast, a study of students at a summer university orientation program found that although both perceptions of parents' disapproval and perceptions of friends' attitudes (i.e., social modeling) were correlated with alcohol-related negative consequences, parents' disapproval was not significant after controlling for perceived friends' attitudes (Wood et al., 2004). Instead, other parental behaviors, such as monitoring, were linked to alcohol-related negative consequences.

Of note, these studies only examined a single, combined measure of alcohol-related consequences. The frequencies of experiencing different alcohol-related negative consequences are correlated (Benton et al., 2006; Read et al., 2006), but the link between parental norms and alcohol-related negative consequences may vary across types of consequences. For example, adolescents who believe their parents strongly disapprove of heavy drinking may take steps to avoid academic and work-related consequences and to avoid drinking and driving, because these consequences may be more easily observed by their parents (e.g., having to tell a parent that they were ticketed for driving under the influence of alcohol, got into a traffic crash, or failed a class). By contrast, perceived parental approval may matter less for health consequences, such as having a hangover or passing out, as these consequences may be more easily hidden from parents.

Approval norms and self-protective strategies

Many alcohol use disorder prevention programs use a harm prevention approach, teaching participants to engage in self-protective strategies rather than encouraging abstinence from alcohol use. Such programs include both strategies to reduce alcohol consumption (e.g., avoiding drinking games) and strategies to prevent drinking and driving (e.g., using a designated

driver). Greater use of these protective behavioral strategies has been associated with lower alcohol use and fewer negative alcohol-related consequences (Borden et al., 2011; Martens et al., 2005, 2007; Ray et al., 2009). Despite this link, few studies have explored whether approval norms are related to use of self-protective strategies. Yet adolescents who believe that their parents or friends strongly disapprove of high-risk drinking may use more self-protective strategies to behave consistently with significant others' values and not risk losing their approval.

We expand on past research by testing whether perceived parental or friends' approval of high-risk drinking is related to the use of self-protective strategies. As with alcohol-related negative consequences, we expected that the link between perceived approval and self-protective strategy use might vary by the type of strategy. For example, perceived parental approval may be directly linked to using self-protective strategies that prevent observable consequences, such as drinking and driving. By contrast, perceived friends' approval could mediate the relationship between perceived parental approval and the use of self-protective strategies to avoid overconsumption of alcohol, which typically would be less easily observed by parents.

Present study

In the present study, we tested the direct and indirect effects of perceived parental approval of high-risk drinking on three types of behavioral outcomes: alcohol use, alcohol-related negative consequences, and use of self-protective strategies. We extended past research in several ways. First, we focused on a sample of students immediately before college matriculation. Most studies have focused on students either in high school or college, even though the transition to college is an important period for the development of alcohol use and alcohol-related negative consequences (Turrisi et al., 2001; Wood et al., 2004). This period also presents its own risks. For example, during the summer before college matriculation, incoming students reported high rates of heavy episodic drinking, playing drinking games, and alcohol-related negative consequences (White & Swartzwelder, 2009). Second, we moved beyond testing the independent contributions of perceived parental and friends' approval to testing whether perceived friends' approval mediates the link between perceived parental approval and behavioral outcomes. Third, we tested the extent to which perceived parental and friends' approval is related to different types of consequences, rather than treating alcohol-related negative consequences as a single construct. We expected that perceived parental approval would have a direct effect on consequences that are more easily observed by parents (e.g., academic- and work-related consequences, drinking and driving) but only an indirect effect (mediated by perceived friends' approval) on consequences that parents are less likely to observe (i.e., health and social consequences). Last, although many intervention studies teach self-protective strategies, few studies have tested whether perceived approval of high-risk drinking is related to college students' use of self-protective strategies. Therefore, we included use of self-protective strategies as a third type of behavioral outcome.

Method

Study sample

During August and September of 2009, numerous U.S. colleges and universities required incoming students to participate in AlcoholEdu for College (Lovecchio et al., 2010; Paschall et

al., 2011), a web-based alcohol education program presently marketed by EverFi, Inc. (Washington, D.C.). Students began AlcoholEdu by completing a web-based survey; most students did so immediately before matriculating at their school. Most schools used an implied mandate: freshmen were told that they had to complete the course, but no real consequences were assessed if they did not, although some schools did impose consequences for students who did not complete the program. Students could not begin the course without completing the baseline survey, although they could skip any questions they did not wish to answer. Overall, 90% of students across all schools completed the baseline survey and the AlcoholEdu course.

A subsample of students from this larger study was randomly assigned to complete a supplemental question set about alcohol norms that were added directly to the primary survey (one of 25 different supplemental question sets). A total of 2,840 students completed the supplemental question set. Our analyses excluded 116 (4%) students who were not freshmen and 28 (1%) students who were 21 years or older. Because our outcomes included negative alcohol-related consequences and use of self-protective strategies, we excluded 899 (32%) students who did not report any past-year alcohol use. Our final sample included 1,797 students from 142 colleges and universities (40.8% public, 27.5% private/nonreligious, and 31.7% private/religious). The number of students per school ranged from 1 to 156 students (Mdn = 7).

Of these students, most were 18 (86%) or 19 (13.1%) years old. The sample was 49.7% female. The majority self-identified as White/Non-Hispanic (76.7%). The remaining students self-identified as Hispanic/Latino (8.6%), Asian/Pacific Islander (8.1%), Black/African American (5.3%), or Native American Indian/Native Alaskan (0.7%); 13 students (0.7%) did not identify their race/ethnicity.

The analysis reported here was conducted on de-identified data collected through the course. The Institutional Review Board for the University of North Carolina at Greensboro approved the study procedure.

Measure

Perceived approval. Perceived friends' approval was the mean of four items adapted from previous studies (e.g., Wood et al., 2004) assessing whether students believed that their closest friends would approve of their drinking (How would your closest friends feel about you: Having one or two drinks nearly every day? Having five or more drinks in one sitting? Getting drunk occasionally? Getting drunk frequently?). Students rated each item from 1 (strongly disapprove) to 7 (strongly approve). Perceived parental approval was the mean of similarly worded items assessing whether students believed that their parents would approve of their drinking. Internal consistency was excellent for both measures ($\alpha = .87$ and $\alpha = .85$, respectively).

Alcohol use. Students who reported consuming alcohol in the past 2 weeks were presented with a calendar for the current month with a large question mark entered for each of the 14 days before the survey date. Students replaced each question mark with the number of alcoholic drinks they had on that day. From their responses, we computed heavy episodic drinking, which was the number of days in that 14-day period that students reported that they had consumed 4+ (women) or 5+ (men) alcoholic drinks. Students who indicated that they had consumed alcohol in the past year, but not in the past 2 weeks, were assigned a score of 0 for this measure. We also computed a second measure of alcohol use, risky drinking, from students ratings of how often they engaged in four risky behaviors when they drink (e.g., "do

shots”), from 1 (never) to 7 (always). Risky drinking was the mean score across these four items. Internal consistency for this measure was acceptable ($\alpha = .75$). Table 1 lists the component items for the risky drinking measure and the other dependent variables.

| |
|--|
| Heavy episodic drinking |
| Number of days in past 14 days that students consumed 4+ (women) or 5+ (men) alcoholic drinks |
| Risky drinking |
| Start drinking before going out (e.g., pre-gaming) |
| Do shots |
| Chug alcohol |
| Choose a drink with high alcohol content |
| Strategies to moderate alcohol use |
| Choose a drink containing less alcohol |
| Pace your drinks to one or fewer per hour |
| Stop drinking at a predetermined time |
| Set a limit on how many drinks you'll have |
| Put extra ice in your drink |
| Monitor your blood alcohol concentration |
| Alternate non-alcoholic beverages |
| Avoid drinking games |
| Keep track of how many drinks you've had |
| Avoid trying to "keep up" |
| Have a friend let you know what you've had enough to drink |
| Hold a drink so people stop bothering you about drinking |
| Make your own drinks to control the amount of alcohol you have |
| Strategies to prevent drinking and driving |
| Prevent a friend from driving under the influence of alcohol |
| Use a designated driver |
| Make plans to avoid driving after drinking |
| Health-related consequences |
| Got a hangover |
| Forgot where you were or what you did |
| Passed out |
| Felt sick to your stomach |
| Academic/work-related consequences |
| Missed a class |
| Got behind on school work |
| Performed poorly on an assignment |
| Missed going to work |
| Got in trouble with authorities |
| Social consequences |
| Injured another person |
| Got into a physical fight |
| Damaged property |
| Was argumentative |
| Said things that you didn't mean that hurt others' feelings |
| Drinking and driving |
| Drove after drinking four or more drinks |
| Drove after drinking five or more drinks |

Table 1. Items used for each dependent variable

Self-protective strategies. We included two measures to assess use of self-protective strategies. First, strategies to moderate alcohol use indicated how often students used strategies to moderate the amount of alcohol they consumed when they drank. Students rated 13 different strategies from 1 (never) to 7 (always) and we calculated the mean across these items. Most of these items were drawn from the Protective Behavioral Strategies Scale (Martens et al., 2005; Martens et al., 2007). Internal consistency for this measure was excellent ($\alpha = .90$). Second, strategies to prevent drinking and driving was the mean score for three items that asked students how often they took specific steps to prevent drinking and driving, from 1 (never) to 7 (always). Internal consistency for this measure was acceptable ($\alpha = .76$).

Alcohol-related negative consequences. Students who had consumed alcohol in the past 2 weeks rated how often they had experienced different consequences during that period when they were drinking or as a result of their drinking, from 1 (never) to 7 (always). Specific items were drawn from several different sources, including the CORE Survey (Presley et al., 1994), the Harvard College Alcohol Survey (Wechsler et al., 1994), and DeJong’s College Drinking Survey (DeJong et al., 2006). These consequences were divided into four categories: health consequences (four items), academic and work consequences (five items), social consequences (five items), and drinking and driving (two items). Internal consistency was acceptable for health consequences ($\alpha = .79$), academic and work consequences ($\alpha = .93$), and social consequences ($\alpha = .81$). The bivariate correlation between the two drinking-and-driving items was $r = .88$.

Results

Descriptive statistics

In this sample of past-year drinkers, 59.1% had consumed alcohol in the past 2 weeks and 36.5% had engaged in heavy episodic drinking at least once in the past 2 weeks. Table 2 provides descriptive information for each measure and their bivariate correlations.

| Variable | Approval norms | | Alcohol use | | Self-protective strategies | | Alcohol-related negative consequences | | | |
|--|-----------------------------|-----------------------------|-------------------------|----------------|----------------------------|------------------------------|---------------------------------------|-----------------|----------------|----------------------|
| | Perceived friends' approval | Perceived parental approval | Heavy episodic drinking | Risky drinking | Moderate alcohol use | Prevent drinking and driving | Health | Academic & work | Social | Drinking and driving |
| Approval norms | | | | | | | | | | |
| Perceived friends' approval | – | | | | | | | | | |
| Perceived parental approval | .51 | – | | | | | | | | |
| Alcohol use | | | | | | | | | | |
| Heavy episodic drinking | .43 | .18 | – | | | | | | | |
| Risky drinking | .38 | .16 | .36 | – | | | | | | |
| Self-protective strategies | | | | | | | | | | |
| Moderate alcohol use | -.44 | -.21 | -.34 | -.20 | – | | | | | |
| Prevent drinking & driving | -.13 | -.16 | -.13 | .03 | .46 | – | | | | |
| Alcohol-related negative consequences | | | | | | | | | | |
| Health | .22 | .12 | .27 | .28 | -.19 | -.07 | – | | | |
| Academic & work | .05 | .21 | .01 | .12 | .00 | -.16 | .37 | – | | |
| Social | .16 | .21 | .18 | .20 | -.09 | -.15 | .45 | .65 | – | |
| Drinking & driving | .19 | .19 | .17 | .17 | -.12 | -.29 | .24 | .44 | .46 | – |
| Descriptive information, <i>M</i> (<i>SD</i>) | 3.30 (1.37) | 1.86 (1.02) | 0.97 (1.75) | 3.12 (1.30) | 3.77 (1.32) | 6.00 (1.42) | 1.62 (1.02) | 1.12 (0.49) | 1.24 (0.64) | 1.18 (0.89) |

Note: All **bold** correlations are significant at $p < .05$

Table 2. Bivariate correlations and descriptive information

Perceived friends’ approval and perceived parental approval were significantly correlated ($r = .51$). The size of the correlation indicates that these measures captured related but distinct constructs.

Perceived friends’ approval was more strongly correlated with both alcohol use measures than was perceived parental approval. By contrast, the pattern of correlations with the self-protective strategy use measures and the alcohol-related negative consequences measures was mixed. Perceived friends’ approval was more strongly correlated with using strategies to moderate alcohol use and with health consequences, whereas perceived parental approval was

more strongly correlated with academic and work consequences. Perceived friends' and parental approval were similarly correlated with using strategies to prevent drinking and driving, social consequences, and actually drinking and driving.

Mediation analyses

Following MacKinnon (2008), we conducted a series of single-mediator analyses to test whether the association between perceived parental approval (X) and each outcome (Y) was mediated by perceived friends' approval (M). In these models, path a is the association between perceived parental approval and perceived friends' approval, path b is the association between perceived friends' approval and the outcome (after controlling for perceived parental approval), path c is the total effect of perceived parental approval on each outcome, and path c' is the direct effect of perceived parental approval on each outcome after controlling for perceived friends' approval (i.e., the portion of the total effect that does not operate through the mediator). The product of paths a and b is the mediated effect. We tested the significance of ab by computing asymmetric confidence limits using RMediation (Tofighi & MacKinnon, 2011); significant mediation is evident when the value 0 does not fall between the lower and upper confidence limits.

We assessed the effect sizes for paths a, b, and c' by obtaining standardized regression coefficients. We assessed the effect size for each mediated effect by calculating the proportion of the total effect that was due to the mediator: ab / c , or $ab / (c' + ab)$. In some cases, the mediated effect was larger than the total effect (i.e., when the direct effect and mediated effect had opposite signs). In these cases, we first calculated the absolute value of ab and c' before calculating the proportion mediated (MacKinnon, 2008).

We estimated all models in MPlus Version 7.0 (Muthén & Muthén, 2012) using full-information maximum likelihood so as to include all available data. We controlled for the clustering of students within schools so as to obtain accurate estimates of the standard errors. Each model included several control variables: the age at which the student first started drinking and indicator variables for student's race/ethnicity (reference group = White), sex (reference group = female), and intended living situation at college (reference group = living away from home). We provide the results from the mediation analysis in Table 3 and the standardized coefficients in Figures 1–3.

Table 3. Results from mediation analyses

| Outcome | a | | b | | c' | | ab ³ | | [95% CI for mediated effect] |
|--|---------|------|----------|------|----------|------|-----------------|------|------------------------------|
| | B | SE | B | SE | B | SE | B | SE | |
| Alcohol use ¹ | | | | | | | | | |
| Heavy episodic drinking | 0.58*** | 0.03 | 0.51*** | 0.04 | -0.10* | 0.05 | 0.30*** | 0.03 | [0.25, 0.35] |
| Risky drinking | 0.58*** | 0.03 | 0.36*** | 0.03 | -0.07 | 0.05 | 0.21*** | 0.02 | [0.18, 0.25] |
| Self-protective strategies ¹ | | | | | | | | | |
| Moderate alcohol use | 0.58*** | 0.03 | -0.36*** | 0.03 | 0.04 | 0.03 | -0.21*** | 0.02 | [-0.25, -0.17] |
| Prevent drinking & driving | 0.58*** | 0.03 | -0.04 | 0.04 | -0.16*** | 0.04 | | | |
| Alcohol-related negative consequences ² | | | | | | | | | |
| Health | 0.53*** | 0.03 | 0.17*** | 0.02 | 0.01 | 0.04 | 0.09*** | 0.01 | [0.06, 0.12] |
| Academic & work | 0.53*** | 0.03 | -0.03* | 0.01 | 0.12*** | 0.03 | -0.02 | 0.01 | [-0.03, 0.00] |
| Social | 0.53*** | 0.03 | 0.03 | 0.02 | 0.10** | 0.03 | | | |
| Drinking & driving | 0.53*** | 0.03 | 0.06* | 0.03 | 0.14** | 0.04 | 0.03 | 0.02 | [-0.01, 0.06] |

Notes: Models controlled for sex, race/ethnicity, age at first drink, and plans to live at home during college. All results are unstandardized coefficients. CI = confidence interval. a = perceived parental approval → perceived friends' approval; b = perceived friends' approval →

outcome, after controlling for perceived parental approval; c' = perceived parental approval \rightarrow outcome, after controlling for perceived friends' approval; ab = mediated effect (the product of paths a and b). 1N = 1,797 students who reported alcohol use in the past year; 2N = 1,078 students who reported alcohol use in the past 2 weeks; 3the mediated effect (ab) was not tested when path a and path b were not both significant. * $p < .05$; ** $p < .01$; *** $p < .001$.

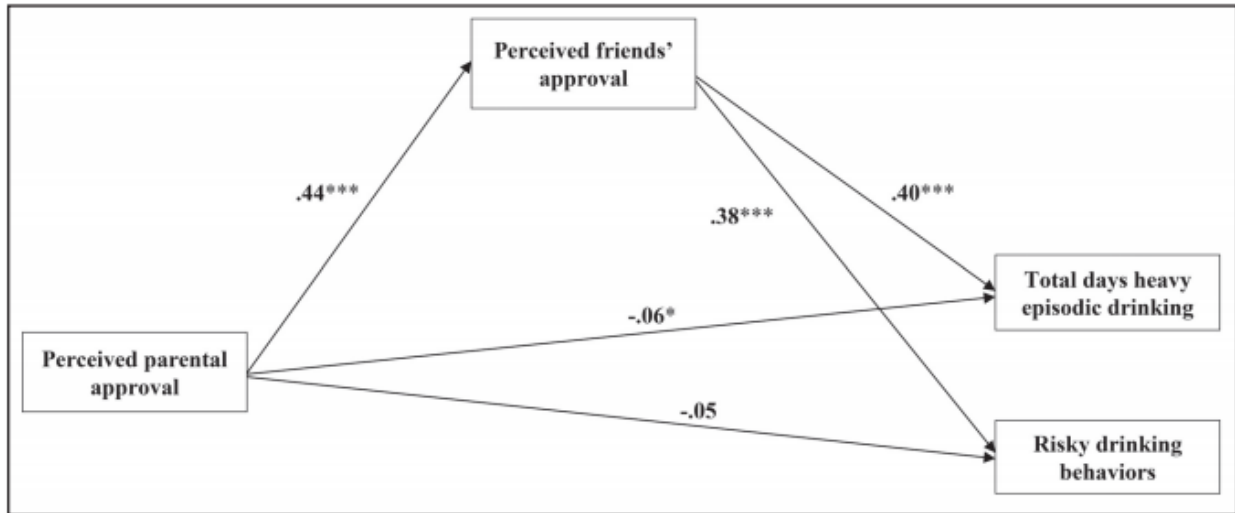


Figure 1. Standardized coefficients from mediation analyses for alcohol use outcomes

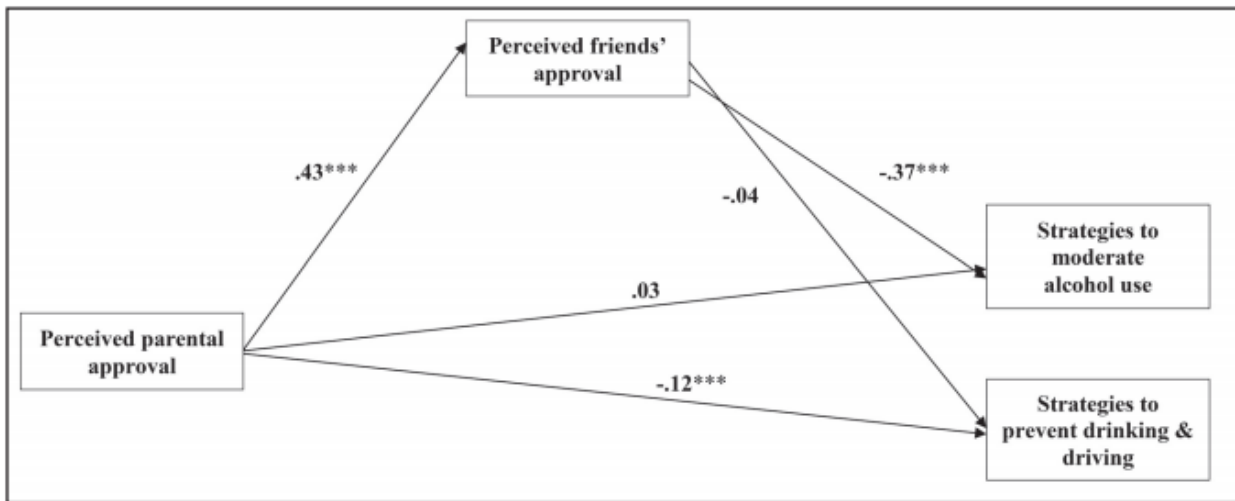


Figure 2. Standardized coefficients from mediation analyses for self-protective strategies

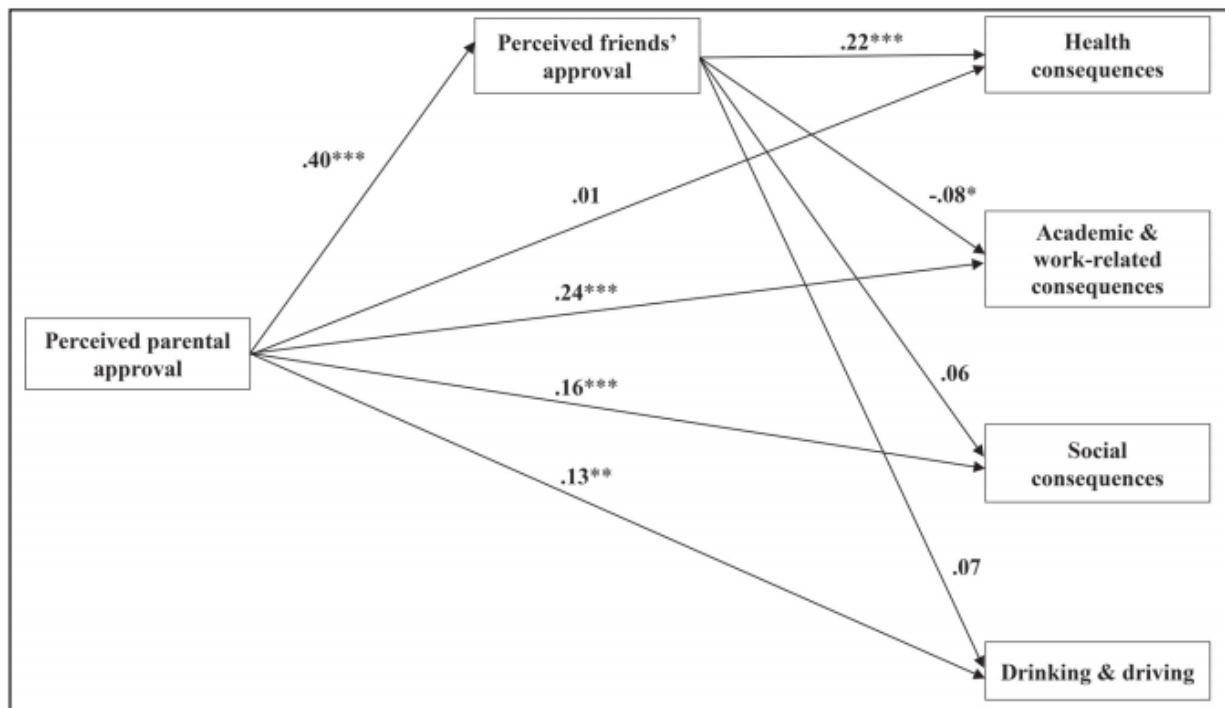


Figure 3. Standardized coefficients from mediation analyses for alcohol-related negative consequences

Alcohol use. Perceived parental approval was associated positively with perceived friends' approval (significant a path), which in turn was associated positively with both heavy episodic drinking and risky drinking (significant b paths for both outcomes). Perceived friends' approval significantly mediated the relationship between perceived parental approval and both heavy episodic drinking and risky drinking (i.e., asymmetric confidence limits for ab paths did not include zero). After we controlled for perceived friends' approval, the direct effect of perceived parental approval (c' path) was negative for heavy episodic drinking and nonsignificant for risky drinking. The proportion of the total effect that was attributable to the mediated effect was .75 for both heavy episodic drinking and risky drinking.

Although our study focuses only on past-year drinkers, we replicated our results with the full sample and found identical results (not shown). Perceived parental approval was associated positively with perceived friends' approval, which in turn was associated positively with heavy episodic drinking and risky drinking; perceived friends' approval significantly mediated the relationship between perceived parental approval and both alcohol use outcomes.

Self-protective strategies. We found a mixed pattern of results for the self-protective strategies measures. Perceived friends' approval was negatively associated with using strategies to moderate alcohol use but was not associated with using strategies to prevent drinking and driving (b paths). By contrast, perceived parental approval was not directly associated with using strategies to moderate alcohol but was directly associated with using strategies to prevent drinking and driving (c' paths). Perceived friends' approval also mediated the association between perceived parental approval and using strategies to moderate alcohol use (proportion mediated = .84).

Alcohol-related negative consequences. Perceived friends' approval was positively related to health consequences and drinking and driving but negatively related to academic and

work consequences (b paths). Perceived parental approval was directly related to academic and work consequences, social consequences, and drinking and driving (c' paths). Perceived friends' approval only significantly mediated the relationship between perceived parental approval and health consequences (proportion mediated = .90).

Discussion

We found that before starting college, perceived friends' approval was strongly linked to first-year students' alcohol related behaviors, but that perceived parental approval was still important. Perceived parental approval was linked in directly—through perceived friends' approval—to alcohol use, strategies to moderate alcohol use, and health consequences. Therefore, one way that parents may influence their students' drinking behavior during late adolescence is by shaping whom students select as friends. In turn, these friends directly shape students' behavior. On the other hand, perceived parental approval also played a direct role for consequences that may be more easily observed by parents: drinking and driving, academic and work consequences, and social consequences. Perceived parental approval was also directly linked to strategies to avoid drinking and driving. Thus, during the time immediately before college, perceived approval from parents and friends shapes alcohol use behaviors and consequences. We review our findings in more detail below.

Both perceived friends' approval of drinking and, to a lesser extent, perceived parental approval were positively correlated with students' alcohol use. As expected, perceived friends' approval fully mediated the relationship between perceived parental approval and alcohol use: students who believed their parents approved of drinking were more likely to believe that their friends approved of drinking, and this perceived approval from friends was positively related to their own drinking. This mediation result may explain the mixed findings from past research (Abar & Turrisi, 2008; Kuther & Higgins-D'Alessandro, 2003; Neighbors et al., 2007, 2008; Wood et al., 2004), which found inconsistent evidence for perceived parental approval being related to alcohol use immediately before and during the first semester of college. We found that perceived parental approval was related to alcohol use, but only through its link to perceived friends' approval.

Students may internalize parents' beliefs about drinking and then select friends whose behaviors and attitudes match these internalized beliefs. Perceptions of parents' beliefs may develop as parents share their views about drinking, shape students' religious identity (Perkins, 1985), model substance use, or engage in behaviors that limit alcohol use, such as monitoring (Van Ryzin et al., 2012). This link between internalized parental norms and selecting friends could become more important once students start college, where they form new friendships, often while being away from home for the first time. Students who believe their parents disapprove of drinking may develop negative attitudes about drinking, leading them to select friends with similar attitudes. In this same vein, students whose parents disapprove of alcohol use for religious reasons may hold religious beliefs akin to those of their parents, leading these students to select friends with similar religious beliefs and thus comparable alcohol use attitudes and behaviors. By contrast, students whose parents imply that alcohol is an integral part of the college experience, share stories about their own drinking during college, or model alcohol use may internalize these views and either select friends who share these attitudes or seek out activities where alcohol use occurs and meet new friends through those activities.

Of note, perceived friends' approval was a distorter variable: once we included it in the model, we found a small but statistically significant negative relationship between perceived parental approval and heavy episodic drinking. It is possible, then, that too much disapproval from parents could slightly increase the risk of heavy episodic drinking, perhaps as students attempt to differentiate themselves from their parents as they enter college. Future studies should explore whether this distortion effect occurs in other samples and with older students.

There was a more mixed pattern of results for alcohol-related negative consequences. Past studies (LaBrie et al., 2010; Neighbors et al., 2007; Wood et al., 2004) that tested the link between perceived approval for drinking and alcohol-related consequences treated consequences as a single construct. We argued that a single construct potentially blurs unique relationships between perceived norms and different types of consequences. Indeed, we found that the role of perceived parental and friends' approval depended on the type of consequence. Perceived friends' approval fully mediated the link between perceived parental approval and health consequences. Students may be able to hide consequences such as feeling sick, getting hung over, and passing out from their parents. Friends, however, may be more likely to observe these consequences and may even be affected by them (e.g., having to clean up after a friend who gets sick from drinking too much). Thus, students who believe that their friends disapprove of drinking may avoid behaviors that lead to these particular consequences.

By contrast, there were significant direct effects of perceived parental approval on academic and work consequences, social consequences, and drinking and driving—all consequences that may be more easily observed by parents. For example, parents may find out if students earn failing grades from missing classes, lose their job because they missed work, or got into a traffic crash because they drove under the influence. We had expected social consequences to be more directly tied to perceived friends' approval because consequences such as being argumentative and saying things that hurt others may affect friends more so than parents. However, several of the items in this measure—injuring someone, damaging property, getting into a fight—may be easily observed by parents, and thus students whose parents disapprove of drinking may try harder to avoid these consequences as well. Of note, perceived friends' approval was also directly associated with drinking and driving. Students whose friends disapprove of high-risk drinking may volunteer to serve as a designated driver or insist on sending their friend home with a sober driver.

We built on past research by also testing the link between perceived approval and use of self-protective strategies. We argued that students who believe their parents or friends strongly disapprove of risky drinking may use strategies to moderate their alcohol use or to avoid consequences, such as drinking and driving. Given the indirect link between perceived parental approval and alcohol use, it was not surprising that the link between perceived parental approval and self-protective strategies to moderate alcohol use was also fully mediated by perceived friends' approval. There was, however, a direct effect of perceived parents' approval on self-protective strategies to prevent drinking and driving: students who believe that their parents disapprove of high-risk drinking were more likely to use strategies to avoid immediately evident consequences that would indicate to their parents that they were drinking heavily.

Limitations

Our findings should be interpreted within the context of several limitations. First, the data were cross-sectional. Therefore, we cannot determine whether perceived approval of high-risk

drinking led to each behavioral outcome or whether individuals who engaged in these behavioral outcomes reported higher perceived approval to justify their behaviors. Of note, however, Larimer et al. (2004) found that approval norms do predict later alcohol use and alcohol-related consequences. They argued that perceived approval may be relatively stable over time, and thus these perceptions may not be influenced by current behavior.

Second, we relied on students' self-reports of whether their friends and parents approved of high-risk drinking, rather than using others' reports of their actual beliefs. Unfortunately, students often misperceive how much their peers actually drink (Kandel, 1996). Therefore, our results must be interpreted as students' perceived approval and not as others' actual approval of high-risk drinking. Perceptions are still important, however, because all interpersonal social influences are filtered through, and shaped by, students' own perceptions and attitudes (Hoffman et al., 2006). Furthermore, what someone thinks that others believe and do is often a stronger predictor of their behavior than what others actually believe and do (Bauman & Ennett, 1996).

Third, our sample only included traditionally aged (i.e., 18–20 years) college students immediately before starting their first semester of college. Although the transition to college represents a particularly risky time for alcohol use (Borsari et al., 2007), the relative role of parents and friends may change across age and stage of alcohol use (e.g., Kuther & Higgins-D'Alessandro, 2003). Therefore, future studies should test whether our results change as students enter and move through college. In addition, there are many alcohol-focused social opportunities on college campuses, which may further exacerbate the influence of peers (Borsari & Carey, 2001) and alter the relative contributions of parents and friends once students are at school.

Last, we excluded students who had not consumed alcohol in the past year. Future studies should explore whether perceived disapproval of high-risk drinking leads some students to avoid alcohol use and test whether perceived parents' or friends' disapproval is more strongly linked to these decisions to avoid alcohol use.

Implications and conclusions

Our results underscore the importance of addressing both friends' and parents' influence on alcohol-related behaviors in alcohol use prevention programs during the transition to college. Specifically, parent-based interventions should be used in concert with strategies that address peer influences. Given that parents still had both direct and indirect effects on students immediately before starting college, outreach to parents should begin well before the start of college. Recommended strategies include teaching parents how to communicate expectancies about alcohol use more effectively with their student and presenting information that can shift parents' own norms about college drinking. Doumas et al. (2013) found that students whose parents received information about heavy episodic drinking and communication strategies before matriculation and early in the fall semester reported significantly less drinking to intoxication compared with students whose parents did not receive this information.

These strategies can also address the specific types of self-protective strategies and alcohol-related negative consequences directly influenced by perceived peer and parental approval. Indeed, providing parents with information on how to talk about alcohol use has been shown to improve the effectiveness of brief motivational interventions in reducing alcohol-related negative consequences with first-year students (Turrisi et al., 2009; Wood et al., 2010). By improving parents' communication skills and shifting parental norms, it may be possible to influence whom students select as friends when they arrive on campus.

References

- Abar, C. C. (2012). Examining the relationship between parenting types and patterns of student alcohol-related behavior during the transition to college. *Psychology of Addictive Behaviors*, 26, 20–29. doi:10.1037/a0025108
- Abar, C., & Turrisi, R. (2008). How important are parents during the college years? A longitudinal perspective of indirect influences parents yield on their college teens' alcohol use. *Addictive Behaviors*, 33, 1360–1368. doi:10.1016/j.addbeh.2008.06.010
- Bauman, K. E., & Ennett, S. T. (1996). On the importance of peer influence for adolescent drug use: Commonly neglected considerations. *Addiction*, 91, 185–198. doi:10.1111/j.1360-0443.1996.tb03175.x
- Benton, S. L., Downey, R. G., Glider, P. S., Benton, S. A., Shin, K., Newton, D. W., . . . Price, A. (2006). Predicting negative drinking consequences: Examining descriptive norm perception. *Journal of Studies on Alcohol*, 67, 399–405. doi:10.15288/jsa.2006.67.399
- Borden, L. A., Martens, M. P., McBride, M. A., Sheline, K. T., Bloch, K. K., & Dude, K. (2011). The role of college students' use of protective behavioral strategies in the relation between binge drinking and alcohol-related problems. *Psychology of Addictive Behaviors*, 25, 346–351. doi:10.1037/a0022678
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391–424. doi:10.1016/S0899-3289(01)00098-0
- Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol*, 64, 331–341. doi:10.15288/jsa.2003.64.331
- Borsari, B., Murphy, J. G., & Barnett, N. P. (2007). Predictors of alcohol use during the first year of college: Implications for prevention. *Addictive Behaviors*, 32, 2062–2086. doi:10.1016/j.addbeh.2007.01.017
- Brown, B. B., Dolcini, M. M., & Leventhal, A. (1997). Transformations in peer relationships at adolescence: Implications for health-related behavior. In J. E. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence*. New York, NY: Cambridge University Press.
- DeJong, W., Schneider, S. K., Towvim, L. G., Murphy, M. J., Doerr, E. E., & Simonsen, N. R. . . . Scribner, R. A. (2006). A multisite randomized trial of social norms marketing campaigns to reduce college student drinking. *Journal of Studies on Alcohol*, 67, 868–879. doi:10.15288/jsa.2006.67.868
- Doumas, D. M., Turrisi, R., Ray, A. E., Esp, S. M., & Curtis-Schaeffer, A. K. (2013). A randomized trial evaluating a parent based intervention to reduce college drinking. *Journal of Substance Abuse Treatment*, 45, 31–37. doi:10.1016/j.jsat.2012.12.008
- Hoffman, B. R., Sussman, S., Unger, J. B., & Valente, T. W. (2006). Peer influences on adolescent cigarette smoking: A theoretical review of the literature. *Substance Use & Misuse*, 41, 103–155. doi:10.1080/10826080500368892
- Kahler, C. W., Read, J. P., Wood, M. D., & Palfai, T. P. (2003). Social environmental selection as a mediator of gender, ethnic, and personality effects on college student drinking. *Psychology of Addictive Behaviors*, 17, 226–234. doi:10.1037/0893-164X.17.3.226
- Kandel, D. B. (1996). The parental and peer contexts of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues*, 26, 289–315. doi:10.1177/002204269602600202

- Kuther, T. L., & Higgins-D'Alessandro, A. (2003). Attitudinal and normative predictors of alcohol use by older adolescents and young adults. *Journal of Drug Education, 33*, 71–90. doi:10.2190/GOPR-XVHT-JL92-HE8T
- LaBrie, J. W., Hummer, J. F., Neighbors, C., & Larimer, M. E. (2010). Whose opinion matters? The relationship between injunctive norms and alcohol consequences in college students. *Addictive Behaviors, 35*, 343–349. doi:10.1016/j.addbeh.2009.12.003
- Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors, 18*, 203–212. doi:10.1037/0893-164X.18.3.203
- Lovecchio, C. P., Wyatt, T. M., & DeJong, W. (2010). Reductions in drinking and alcohol-related harms reported by first-year college students taking an online alcohol education course: A randomized trial. *Journal of Health Communication, 15*, 805–819. doi:10.1080/10810730.2010.514032
- MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Martens, M. P., Ferrier, A. G., Sheehy, M. J., Corbett, K., Anderson, D. A., & Simmons, A. (2005). Development of the Protective Behavioral Strategies Survey. *Journal of Studies on Alcohol, 66*, 698–705. doi:10.15288/jsa.2005.66.698
- Martens, M. P., Pederson, E. R., LaBrie, J. W., Ferrier, A. G., & Cimini, M. D. (2007). Measuring alcohol-related protective behavioral strategies among college students: Further examination of the Protective Behavioral Strategies Scale. *Psychology of Addictive Behaviors, 21*, 307–315. doi:10.1037/0893-164X.21.3.307
- Mrug, S., & McCay, R. (2013). Parental and peer disapproval of alcohol use and its relationship to adolescent drinking: Age, gender, and racial differences. *Psychology of Addictive Behaviors, 27*, 604–614. doi:10.1037/a0031064
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus Version 7: User's guide*. Los Angeles, CA: Authors.
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy drinking college students? *Journal of Studies on Alcohol and Drugs, 68*, 556–565. doi:10.15288/jsad.2007.68.556
- Neighbors, C., O'Connor, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors, 22*, 576–581. doi:10.1037/a0013043
- Perkins, H. W. (1985). Religious traditions, parents, and peers as determinants of alcohol and drug use among college students. *Review of Religious Research, 27*, 15–31. doi:10.2307/3511935
- Paschall, M. J., Antin, T., Ringwalt, C. L., & Saltz, R. F. (2011). Evaluation of an Internet-based alcohol misuse prevention course for college freshmen: Findings of a randomized multi-campus trial. *American Journal of Preventive Medicine, 41*, 300–308. doi:http://dx.doi.org/10.1016/j.amepre.2011.03.021
- Perkins, H. W., & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues, 26*, 961–974. doi:10.1177/002204269602600413

- Presley, C. A., Meilman, P. W., & Lyerla, R. (1994). Development of the CORE Alcohol and Drug Survey: Initial findings and future directions. *Journal of American College Health*, 42, 248–255. doi:10.1080/07448481.1994.9936356
- Ray, A. E., Turrisi, R., Abar, B., & Peters, K. E. (2009). Social-cognitive correlates of protective drinking behaviors and alcohol-related consequences in college students. *Addictive Behaviors*, 34, 911–917. doi:10.1016/j.addbeh.2009.05.016
- Read, J. P., Kahler, C. W., Strong, D. R., & Colder, C. R. (2006). Development and preliminary validation of the young adult alcohol consequences questionnaire. *Journal of Studies on Alcohol*, 67, 169–177. doi:10.15288/jsa.2006.67.169
- Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol*, Supplement 14, 54–70. doi:10.15288/jsas.2002.s14.54
- Small, M. L., Morgan, N., Abar, C., & Maggs, J. L. (2011). Protective effects of parent-college student communication during the first semester of college. *Journal of American College Health*, 59, 547–554. doi:10.1080/07448481.2010.528099
- Tofighi, D., & MacKinnon, D. P. (2011). RMediation: An R package for mediation analysis confidence intervals. *Behavior Research Methods*, 43, 692–700. doi:10.3758/s13428-011-0076-x
- Turrisi, R., Jaccard, J., Taki, R., Dunnam, H., & Grimes, J. (2001). Examination of the short-term efficacy of a parent intervention to reduce college student drinking tendencies. *Psychology of Addictive Behaviors*, 15, 366–372. doi:10.1037/0893-164X.15.4.366
- Turrisi, R., Larimer, M. E., Mallett, K. A., Kilmer, J. R., Ray, A. E., Mastroleo, N. R., . . . Montoya, H. (2009). A randomized clinical trial evaluating a combined alcohol intervention for high-risk college students. *Journal of Studies on Alcohol and Drugs*, 70, 555–567. doi:10.15288/jsad.2009.70.555
- Van Ryzin, M. J., Fosco, G. M., & Dishion, T. J. (2012). Family and peer predictors of substance use from early adolescence to early adulthood: An 11-year prospective analysis. *Addictive Behaviors*, 37, 1314–1324. doi:10.1016/j.addbeh.2012.06.020
- Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college. A national survey of students at 140 campuses. *JAMA*, 272, 1672–1677. doi:10.1001/jama.1994.03520210056032
- White, A., & Swartzwelder, S. H. (2009). Inbound college students drink heavily during the summer before their freshman year: Implications for education and prevention efforts. *American Journal of Health Education*, 40, 90–96. doi:10.1080/19325037.2009.10599083
- Wood, M. D., Fairlie, A. M., Fernandez, A. C., Borsari, B., Capone, C., Laforge, R., & Carmona-Barros, R. (2010). Brief motivational and parent interventions for college students: A randomized factorial study. *Journal of Consulting and Clinical Psychology*, 78, 349–361. doi:10.1037/a0019166
- Wood, M. D., Read, J. P., Mitchell, R. E., & Brand, N. H. (2004). Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviors*, 18, 19–30. doi:10.1037/0893-164X.18.1.19