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## An Update of Research Examining College Student Alcohol-Related Consequences: New Perspectives and Implications for Interventions

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### Abstract

The objective of this review is to provide an update on existing research examining alcohol-related consequences among college students with relevance for individual-based interventions. While alcohol-related consequences have been a focus of study for several decades, the literature has evolved into an increasingly nuanced understanding of individual and environmental circumstances that contribute to risk for experiencing consequences. A number of risk factors for experiencing alcohol-related consequences have been identified, including belonging to specific student subgroups (e.g., Greek organizations) or drinking during high-risk periods, such as spring break. In addition, the relationship between students' evaluations of both negative and positive consequences and their future drinking behavior has become a focus of research. The current review provides an overview of high-risk student subpopulations, high-risk windows and activities, and college students' subjective evaluations of alcohol related consequences. Future directions for research are discussed and include determining how students' orientations toward consequences change over time, identifying predictors of membership in high-risk consequence subgroups, and refining existing measures of consequences to address evolving research questions.

### Keywords

College students; Alcohol-related consequences

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The subject of this mini-review has been presented in a symposium held at the Research Society on Alcoholism (RSA), June 25 to June 29, 2011 (Atlanta, GA). Organizer and Chair of the symposium was Kimberly A. Mallett. Introducer was Kimberly A. Mallett. Speakers were Jennifer P. Read, Lindsey Varvil-Weld, Clayton Neighbors, and Brian Borsari. Discussant was Helene R. White.

## Introduction

College students experience a variety of negative alcohol-related consequences. Over the course of a year, approximately half of students experience hangovers or physical illness, nearly a quarter report blackouts and driving after drinking, 30% report getting into physical or verbal fights, and almost 1 out of 5 students reports falling behind in their schoolwork (Perkins, 2002). Despite substantial efforts aimed at reducing problematic college student drinking and related harms, rates of consequences have not declined and serious consequences among older college students (ages 21-24) have increased (Hingson et al., 2009).

Numerous research efforts have focused on reducing alcohol consumption in order to also reduce related problems among college students. Among these efforts, individual-based brief motivational interventions (BMI) have been shown to be efficacious in reducing drinking for a variety of students; however reductions in consequences have been less consistent (Cronce and Larimer, 2011). The current review is an update of the consequence literature that pertains to these widely used intervention efforts targeting college students, which are based on several theories such as social learning, self-efficacy, expectancy, and planned behavior (Dimeff et al., 1999). These interventions have the potential to be strengthened by incorporating findings from research pertaining to students' increased likelihood of experiencing consequences. This review emphasizes ways to enhance BMIs, by highlighting a variety of novel and recent research examining alcohol related consequences.

Several studies have shown college students experience alcohol-related consequences as a result of a variety of factors beyond alcohol consumption alone. Alcohol use and alcohol-related consequences are correlated, but not perfectly so, and research suggests that there are different etiological pathways to use and to consequences (Larimer et al., 2004; Neal and Carey, 2007). The delineation of these distinct pathways is important because interventions which decrease use may not necessarily also decrease consequences. To date, studies have examined affective, coping, and behavioral constructs that explain additional variance in consequences above and beyond drinking. Specifically, research has identified predictors that are modifiable and included in existing brief intervention formats, such as students' willingness to experience consequences, normative influences, and protective behavioral strategies. For example, Mallett and colleagues (2011b) found that students who were more willing to experience specific consequences were significantly more likely to report experiencing those consequences (hangover, black out, vomiting, and becoming rude or obnoxious), even after controlling for drinking. Considering that these students were not highly motivated to avoid consequences, they may engage in riskier behavior when they drink and use fewer protective behaviors to avoid consequences, resulting in increased problematic outcomes.

Studies have explored components of BMIs that directly impact consequences in order to better understand mechanisms of change and ways to enhance the intervention content. Specifically, normative influences and protective behavioral strategies have been identified as both key components of BMIs and independent predictors of consequences. While studies of norms have shown higher peer and parental approval of drinking is associated with increased drinking and experiencing more consequences (e.g., Neighbors et al., 2007), recent work has examined normative perceptions specific to consequences. In a study conducted by Lee and colleagues (2010), students overestimated the frequency with which other students experience consequences and underestimated how negatively other students evaluated consequences. Considering the robust associations between normative influences and consequences, consequence-specific norms appear to be a promising avenue through

which intervention efforts could be effective. Finally, while protective behaviors have been defined as behavioral strategies used to limit alcohol consumption and/or minimize consequences (Benton et al., 2004), protective behaviors may be one mechanism through which students can reduce the consequences they experience without necessarily reducing the amount they drink. Several studies have shown that protective behaviors (e.g., alternating between alcoholic and non-alcoholic drinks) are associated with fewer consequences, even after controlling for drinking (e.g., Ray et al., 2009).

The evolution of research examining alcohol-related consequences has permitted a more nuanced, individualized understanding of these processes that can inform the content and implementation of individual-based intervention approaches. The current review provides an update on research examining consequences among college students highlighting the following topics: 1) *high-risk students* who are prone to experiencing consequences; 2) *high-risk events and activities* when students have an elevated risk of experiencing consequences; and 3) *students' subjective evaluations of consequences* and their association with subsequent alcohol consumption and a continued pattern of high-risk behavior.

## High-Risk Students

### Members of Greek organizations

Several studies have identified members of Greek organizations as the highest risk students for engaging in heavy drinking and experiencing related problems. In general, members of fraternities and sororities drink more and experience significantly more problems than non-Greek students, including more severe dependence-related consequences (Borsari et al., 2009). That said, some interesting findings have emerged regarding alcohol-related consequences in this subpopulation. In one study, when compared with other high-frequency female drinkers, sorority members actually experienced fewer consequences, possibly due to the use of protective behaviors (Larimer et al., 2000). In another study with both fraternity and sorority members, those who perceived less normative approval of excessive drinking by fellow members experienced fewer consequences (Larimer et al., 2004). These findings suggest that behavioral and normative influences can mitigate risks of experiencing consequences in both male and female members of the Greek system.

### Students experiencing psychological distress

In addition to social affiliation, mental health issues are also associated with experiencing higher rates of consequences in the general student population (e.g., Martens et al., 2008). The relationship between drinking motives, particularly those associated with coping, and consequences has been examined in order to better understand increased risk among these students (e.g., Carey and Correia, 1997). Specifically, students who report drinking to cope as a motivation for alcohol consumption tend to experience higher rates of consequences such as academic problems, risky behavioral patterns, and poor self-care. These outcomes represent more chronic patterns of problematic alcohol use with the potential for long-term negative consequences (Merrill and Read, 2010). Other studies have found drinking to cope to be related to increased problems, while drinking for enhancement reasons was associated with increased consumption (Stewart et al., 2001). It should be noted that the causal relationships among psychological distress, drinking, and consequences has been challenging to decipher. For example, feelings of hostility and sadness have been associated with increased drinking among college students, leading to subsequent feelings of guilt, hostility, and sadness, most likely related to the consequences experienced during the previous drinking episode (Hussong et al., 2001). This finding suggests some individuals exhibit a chronic and possibly circular pattern of negative affect, drinking, and

consequences, making it difficult to parse out the degree to which depression and alcohol consumption contribute to experiencing consequences.

### **Mandated students**

Mandated students are those who have been cited for violating campus alcohol policy. These citations may range from minor events (e.g., possession of alcohol) to severe incidents (e.g., being transported to the hospital for alcohol poisoning). By definition, mandated students have already exhibited alcohol-related problems by being caught and sanctioned for an alcohol violation. Furthermore, participation in high-risk drinking activities such as pre-gaming or drinking games are common in this population (Borsari et al., 2007). However, despite having experienced consequence(s), mandated students appear to be a heterogeneous population in terms of alcohol-related risk. Specifically, Barnett and colleagues (2008) combined data from four separate clinical trials of brief interventions with mandated students, and used cluster analysis to identify three profiles reflecting the heterogeneity of the mandated student population. Each of these profiles had unique clinical implications.

The first cluster, “Bad Incident,” exhibited similarly low levels of typical heavy drinking, but a high level of drinking during the incident, and high levels of responsibility and aversion toward the consequence. Therefore, students in the “Bad Incident” cluster may be particularly troubled and ashamed about the incident, providing a “teachable moment” in which they would be receptive to strategies to reduce alcohol use and related risk. Individuals in this category did not engage in regular high-risk activity; however, they may be more prone to engage in heavy drinking and experience increased consequences during special events or occasions (e.g., holidays), indicating that an event-specific intervention may be most appropriate with these individuals. The second cluster, labeled the “Why Me?” cluster, were characterized by typically low levels of heavy drinking, very low blood alcohol levels during the referral incident, and low self-reported responsibility for and aversion toward the consequence. These students often associate the violation with being in the wrong place at the wrong time rather than their own behavior, which may be accurate. Thus, the “Why Me?” group may not benefit from an intervention that focuses on heavy drinking and related consequences or on the referral incident. Students in the final cluster, “So What?,” reported typically drinking heavily and personal responsibility for the incident, yet low aversion regarding the incident. These individuals may be most at risk considering they engaged in a heavy pattern of consumption on a regular basis and had relatively little motivation to avoid receiving an alcohol violation in the future. Thus, students in the “So What?” group continue to be at risk of experiencing alcohol-related consequences, yet do not view the consequence as particularly aversive. Therefore, a focus on the referral incident (or event-specific interventions) may not be as clinically relevant as a focus on more global strategies to reduce alcohol use and related consequences.

### **Students with a history of experiencing consequences**

It is not uncommon for students to report experiencing consequences repeatedly. However, some individuals may be more likely to engage in high-risk behavioral patterns resulting in experiencing a disproportionate amount of alcohol-related consequences. A study conducted by Mallett and colleagues (2011c) identified a subgroup of students who experienced several different consequences repeatedly over the course of their freshman year. While 23% of the sample met criteria for this subgroup, they accounted for almost half of all of the consequences reported by the entire study sample. A follow-up study conducted by Varvil-Weld and colleagues (2012) found that students who reported negative relationships with their fathers were more likely to be in the high consequence group. In addition, individuals

who had good relationships with their parents, but perceived their parents to be more pro-alcohol, were also at an increased risk of being in this high-risk group.

### High-Risk Events and Activities Associated with Alcohol Consequences

**Transition to college**—There is ample evidence suggesting that college students increase their drinking and consequences during the transition from high school to college (Borsari et al, 2007b). As a result, universities often target incoming first-year students with intervention efforts during this window in order to reduce drinking and associated problems; however there is limited information about predictors of changes in consequences during this transition. One study examined students' pre-college consequences as predictors of consequences during the first year of college and found that students who experienced more consequences prior to college experienced more consequences during the first year of college, even after drinking was held constant (Mallett et al., 2011a). Mediation analyses revealed that riskier drinking styles (e.g., playing drinking games) accounted for the association between pre-college and college consequences. Thus, the assessment of prior consequences can potentially be used to alert interventionists to those at greatest risk for future consequences. Research has shown a history of consequences predicts later increases in drinking and problems (Mallett et al, 2011a; Read et al., 2007), thus, consequences may denote those who are on an upward trajectory in their drinking and/or more likely to experience problems in college.

**Event specific occasions**—Data suggest that drinking during special occasions and holidays often exceeds typical weekend drinking patterns and results in increased risk of related problems (Neighbors et al., 2011). Several holidays during the calendar year, such as New Year's Eve, Halloween, Saint Patrick's Day, Fourth of July, and Cinco de Mayo, are associated with increased alcohol consumption and presumably related consequences. While research examining specific holidays still is emerging, several events are consistently associated with excessive drinking and alcohol-related consequences.

First, studies examining 21<sup>st</sup> birthday celebrations have shown that nearly 90% of students report consuming alcohol and tend to reach relatively high blood alcohol concentrations (BACs) even if they are not typically heavy drinkers (Lewis et al., 2009). During these celebrations, students frequently engage in risky behaviors and experience consequences such as blackouts, vomiting, and hangovers and these consequences are directly related to higher BACs (e.g., Brister et al., 2011). Extreme 21<sup>st</sup> birthday drinking can lead to a range of severe and life threatening consequences (i.e., alcohol poisoning) and has received increasing attention. Students report intentions to consume a lot of alcohol during this occasion and interventions attempting to reduce drinking during 21<sup>st</sup> birthdays have been met with mixed success. While interventions have shown some efficacy, students still report high BACs and continue to experience consequences (Lewis et al., 2008; Neighbors et al., 2009). Policy-level and/or environmental interventions directly targeting 21<sup>st</sup> birthday drinking may be needed to further reduce consequences. For example, Minnesota passed a law in 2005 preventing youth from purchasing alcohol between midnight and 8 am on their 21<sup>st</sup> birthday.

Second, spring break trips are another common college experience associated with increased consequences. For example, Patrick and colleagues (2011) found that over 30% of one sample reported having a hangover during the 10-day spring break window. Other work showed that typical drinking moderated the association between spring break drinking and consequences such that students who were typically lighter drinkers were more likely to experience consequences as a result of their spring break drinking than students who were typically heavier drinkers (Lee et al., 2009). This finding suggests that lower-risk students



may perceive spring break as a time associated with decreased responsibility when it is more acceptable to engage in heavy drinking, and are more willing to experience consequences. These findings present an opportunity to tailor intervention delivery around specific events, such as spring break, considering their association with harm for a wide range of students.

Third, athletic events, particularly collegiate football games, are associated with a variety of high-risk drinking behavior and related problems. Students often participate in drinking activities related to game day festivities, such as tailgates, and many students consume large amounts of alcohol and experience a variety of physical consequences such as hangovers, vomiting, and blackouts as well as increased rates of drinking and driving, injuries, and arrests (Glassman et al., 2010; Rees and Schnepel, 2009).

Taken together, there are several events occurring during the academic year in which a wide variety of drinkers may be at an elevated risk of engaging in high-risk behavior and experiencing related problems. For the most part, studies in this emerging area have not examined risk factors for consequences controlling for amount of consumption. This is probably due in part to the close link between achieved BAC and typical consequences assessed for specific events such as 21<sup>st</sup> birthdays. Some studies have considered typical drinking as a risk factor for consequences. In the case of spring break trips and 21<sup>st</sup> birthdays, it appears that students who are typically lighter drinkers actually experience similar or higher rates of consequences, compared to heavy drinkers, when they participate in high-risk drinking events. Moreover, some events, such as spring break, may be viewed as a time out from normal self-regulation regarding excessive behavior, leading students to drink more than they typically would.

**Alcohol-oriented activities**—In addition to these significant high-risk events, research has examined specific high-risk activities such as drinking games and pregaming. As described by Borsari (2004), not only is it common for drinking game players to consume large amounts of alcohol in a short time period, but research has also shown that individuals who participate in this activity experience more severe consequences after controlling for drinking. Further, women who participate in drinking games are at an increased risk of experiencing sexual assault.

Another high-risk drinking activity, pregaming, is defined as drinking before attendance at a social event, such as going to a bar, party, concert, sporting event, etc. Pregaming can be particularly risky because it is associated with consuming large amounts of alcohol during a short period of time, and achieving increased levels of intoxication before moving to a different location. Pregaming is quite common across college campuses, with studies showing prevalence rates as high as 70% among drinkers in the general student population, and those students who pregame do so before approximately 30-45% of their drinking occasions (Read et al., 2010). Individuals appear to be more prone to negative consequences when pregaming (e.g., Glassman et al., 2010), perhaps because pregaming essentially consists of engaging in a riskier style of drinking, engaging in fewer protective behaviors, and reaching higher BACs. More research is needed to better understand the precise mechanisms of risk associated with this practice.

### Students' Subjective Evaluations of Consequences

While a considerable amount of research focusing on consequences has examined high-risk individuals and high-risk activities, additional research has examined students' subjective evaluations of both positive and negative consequences. The majority of consequence-focused research has examined negative consequences resulting from drinking; however, most college students also report experiencing a variety of positive consequences (Lee et al., 2011; Park, 2004). Importantly, emerging research shows that even those outcomes

traditionally viewed as negative by researchers and campus administrators, may in fact be viewed as positive by the students themselves. This difference is important because evaluations of consequences have implications for future drinking. Consequences perceived as “negative” (e.g., physical accidents) are typically aversive to students and thus may functionally punish drinking behavior and lead to reductions in drinking. In contrast, those consequences that are viewed as “positive” (e.g., had more fun) reinforce drinking. While expectancy research has assessed students’ perceptions of how good or bad expected outcomes of drinking would be (Fromme et al., 1993), limited research has examined students’ perceptions of alcohol consequences that they actually have experienced.

Mallett and colleagues (2008) studied students’ perceptions of commonly endorsed “negative” consequences that they reported experiencing during the past year and found that students did not perceive all consequences as aversive. In fact, a substantial proportion of students rated experiencing hangovers and blackouts as neutral or positive experiences. Further, holding more neutral or positive perceptions of consequences was positively associated with high-risk drinking. While bidirectional associations between drinking and cognitive factors (e.g., evaluations expectancies) have been shown, the causal pattern of the association between perceptions of consequences and high-risk drinking has not been adequately assessed due to few longitudinal studies following youth as their drinking careers develop. Other studies have shown the majority of college students are generally motivated to drink for celebratory and social enhancement reasons and report more positive outcomes of drinking compared to negative consequences (Park, 2004). It is plausible that many students believe experiencing less desirable consequences (e.g., hangovers) is simply part of the overall drinking experience. Students may thus be willing to experience the so-called “negative” consequences because the downsides of these consequences are outweighed by the desirable outcomes that come along with them. Despite their relevance for individuals’ decisions to drink, positive consequences – or the perception of consequences as being positive – have been understudied, particularly as they occur in conjunction with negative consequences.

Patrick and Maggs (2011) addressed this gap by examining students’ evaluations of both “positive” and “negative” consequences and how these evaluations related to alcohol use and problems. As expected, more favorable ratings of both “positive” and “negative” consequences were associated with higher rates of drinking and consequences at follow up. However, students’ evaluations of “positive” consequences were not unanimously favorable (e.g., “relieving boredom” was perceived as neutral or negative by the majority of the sample). To a lesser degree, variations in the evaluations of “negative” consequences also were observed. Therefore, researchers’ classifications of “positive” and “negative” consequences might be incongruent with students’ perceptions, which has important implications for providing feedback to students about their consequences.

If experiencing consequences is not always a deterrent from drinking (Mallett et al., 2006; Patrick and Maggs, 2008), then which consequence(s) are most salient and have the greatest influence on future drinking? Lee and colleagues (2010) found social consequences, both positive and negative, were most strongly associated with students’ overall evaluations of their drinking experience. In relation to the influence of positive and negative consequences on future drinking intentions, Park (2004) found that students were more strongly influenced by their most positive experience rather than their most negative one.

Merrill and colleagues (2012) examined the relationship between students’ subjective evaluations of alcohol consequences and subsequent alcohol consumption using weekly self-reports. Results of the study indicated that subsequent drinking was influenced by students’ evaluations of consequences rather than simply experiencing the consequences. Specifically,



negative evaluations of experienced consequences predicted downward changes in alcohol consumption during the following week. This study highlights the importance of assessing individuals' perceptions of the consequences they experience, rather than just which consequences they experience, in order to better understand subsequent drinking behavior.

### Implications and Directions for Future Research

Drinking is a required precursor of alcohol-related consequences; that said, many other factors are associated with problematic outcomes and may be malleable targets of intervention efforts. It is important to make a distinction regarding in what way consequences are "problematic." Several studies have focused on consequences that presage longer-term drinking problems such as physiological dependence symptoms observed in adolescents and young adults predicting problematic patterns of drinking later in adulthood (e.g., O'Neill and Sher, 2000). However, there are other ways that consequences might be problematic. For instance, a study conducted by Read and colleagues (2007) showed that not only did impaired control and physiological dependence predict later drinking, but blackouts predicted poor academic performance. More recent work has shown that certain types of consequences (i.e., blackouts) were associated with escalations in drinking as the school year progressed (Read et al., 2012). Finally, other acute consequences such as driving under the influence arrests, risky sexual behavior, and sexual victimization all have highly toxic effects that can last a lifetime. Therefore it is important to understand early predictors of these serious consequences in order to prevent them.

Studies have also identified high-risk students based on specific patterns of consequences they experience, associated risks, motives, and subjective evaluations of these experiences. However, our understanding of the mechanisms underlying these associations remains limited. More focused consideration of decision-making processes, protective versus risky drinking behaviors, and motivations may allow researchers to improve intervention efforts for these individuals. In addition, targeting students who experience consequences repeatedly and specific types of mandated students (i.e., "So What" group) with individual-based interventions focusing on enhancing motivation to avoid alcohol-related problems may result in students viewing their consequences differently and promote behavior change.

Improved understanding of high-risk windows and activities associated with alcohol consequences will inform future intervention efforts about the optimal delivery times and risky activities to specifically target. Research examining harm associated with specific holidays is still emerging; however, work examining 21<sup>st</sup> birthdays, spring break trips, and sporting events highlights the risk associated with event-specific drinking. Advantages of event specific prevention approaches include foreknowledge regarding the timing of risky events and relatively shorter time periods required for intervention efforts. Future work is needed to identify additional predictors of consequences during high-risk occasions as well as risks associated with general times and settings, in order to refine event-specific prevention programs (see Neighbors et al., 2011). For example, a gap in the literature remains with respect to how consequences experienced during special events vary as a function of additional individual and contextual factors (e.g., protective behaviors, participation in holiday parties, tailgating, etc.). In addition, more work is needed to examine the relationship between participation in alcohol-oriented activities (i.e., drinking games and pre-gaming) in relation to both high-risk events and high-risk subpopulations.

Subjective evaluations of consequences have demonstrated that experiencing a consequence does not necessarily deter subsequent drinking; rather, the students' evaluation of the consequence is most influential. More information is also needed to explain how experiencing specific types of consequences (both positive and negative) influences individuals' evaluations of drinking-related outcomes. For instance, it would be valuable to

identify which consequences are more salient and negative (e.g., sexual assault), and thus more likely to reduce subsequent drinking. In addition, it is unclear if individuals become desensitized to the negative effects of drinking and focus on the positive effects over time. Given the prevalence of positive and neutral subjective evaluations of consequences, research is needed to examine the relationship between subjective evaluations of consequences and drinking motives, use of protective behaviors, and drinking intentions. Students who are highly motivated to drink to hang out with friends or to fit in, may be willing to endure some consequences (e.g., hangover) to achieve these objectives. Existing individual-based interventions may benefit by including a decisional balance exercise to systematically highlight students' perceived benefits and perceived risks. This motivational approach may allow students to further consider negative aspects of experiencing consequences.

As consequence-focused research continues to grow, some of the measures commonly used in this population (e.g., RAPI: White and Labouvie, 1989; YAACQ: Read et al., 2006; YAAPST: Hurlbut and Sher, 1992) may be adapted to address new research questions. For instance, measures currently do not capture individuals' evaluations of consequences or the setting in which the consequence occurred. More consistency across time referents used in measures is needed. For example, some consequence scales address lifetime or past year experiences, while other measures refer to specific occasions. Moving forward, in addition to studying prevalence of consequences, studies using these measures may be expanded by modifying them to include subjective evaluations of their valence (i.e., whether the consequence was experienced as positive or negative). In addition, incorporating measures of uniquely positive consequences (e.g., "I approached a person that I probably wouldn't have spoken to otherwise" PDCQ: Corbin et al., 2008) may help elucidate the reinforcing components of drinking events. As the study of drinking-related consequences becomes more sophisticated, new measures may need to be developed and refined to answer the questions posed.

## Conclusion

In sum, this review has identified several implications for individual-based interventions. Specifically, information provided in the review can inform intervention efforts in terms of identifying the highest risk individuals and behaviors related to consequences that may be helpful to target, and emphasizing the need to address subjective evaluations of consequences rather than assuming, perhaps incorrectly, that students find all consequences aversive and/or are motivated to avoid them. In addition, while individual factors are undoubtedly very important predictors of alcohol consequences, they are only a subset of predictors. Environmental factors (e.g., advertising, promotion, outlet density, alcohol availability, the economy, university or community regulations, policies, enforcement) or other factors, such as price or content of drinks, labeling, container size, and beverage type were not included in this review. These factors all contribute to students' drinking context and comprehensive studies are needed to examine all of these issues simultaneously. Overall, individual-based interventions enhanced by incorporating consequence-specific predictors, addressing subjective evaluations of consequences, and targeting both high-risk windows and students have the potential to be more efficacious in reducing problematic consequences among college students.

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