



## Protective behavioral strategies for reducing alcohol involvement: A review of the methodological issues



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### HIGHLIGHTS

- Protective Behavioral Strategies (PBS) are putative mechanisms of behavior change.
- PBS are inconsistently related to alcohol consumption/consequences.
- PBS measures vary greatly in definition.
- PBS studies vary in the conceptual relationship between strategy use and behavior.
- Personalization of PBS measures could disentangle the ambiguity in the literature.

### ARTICLE INFO

#### Keywords:

Protective behavioral strategies

Alcohol

College students

### ABSTRACT

Alcohol use among college students remains a major public health concern with many students experiencing negative alcohol-related consequences as a result of their drinking. Protective behavioral strategies (PBS) have been conceptualized as skills used by drinkers to moderate their drinking and/or resulting consequences. The correlational evidence for the relationships among PBS, alcohol use, and related problems has been mixed. Experimental research reveals inconsistent relationships among intervention condition, PBS use, and alcohol outcomes. There is currently insufficient evidence to support the claim that PBS function as a mechanism of behavior change for college drinkers. We propose that the inconsistencies found in the correlational and experimental research are explained in part by psychometric and methodological issues. This review summarizes measurement and methodological issues in studies that have directly assessed the relationship between PBS and alcohol use and/or alcohol-related consequences in college drinking samples. Additionally, we provide some suggestions and future directions to overcome methodological and conceptual limitations and to advance understanding of the role of protective behavioral strategy use in reducing alcohol involvement among college drinkers.

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## 1. Introduction

For many young adults attending college, drinking alcohol can facilitate several of the developmental processes characteristic of emerging adulthood (e.g., exploring identity, making independent decisions, facilitating social and emotional adjustment to transitions; see Arnett, 2005). However, nearly half of college students in the United States report high volume patterns of drinking, defined as five or more drinks on an occasion in the last month (Hingson, Zha, & Weitzman, 2009). Such high volume drinking among college students results in over 1800 deaths per year (Hingson et al., 2009), as well as poor academic performance, risky sexual behavior, and personal injury for many more (Wechsler & Nelson, 2008). The prevention or reduction of these alcohol-related consequences is the focus of skills-based alcohol interventions often used on college campuses (e.g., Dimeff, Baer, Kivlahan, & Marlatt, 1999).

One way to prevent or reduce alcohol-related consequences is to promote the use of protective behavioral strategies (PBS). PBS can be defined as behaviors that individuals can engage in either *while* drinking or *instead of* drinking that are designed to limit negative alcohol-related consequences and/or reduce alcohol consumption (Martens et al., 2004; Sugarman & Carey, 2007). Greater use of PBS has been associated with lower alcohol consumption and negative alcohol-related consequences (e.g., Martens et al., 2005; Werch & Gorman, 1986). A majority of student drinkers use PBS naturally, on their own in the absence of an intervention (e.g., Sugarman & Carey, 2007). Moreover, students consistently report that their repertoire consists of several PBS (Howard, Griffin, Boekeloo, Lake, & Bellows, 2007).

A variety of interventions have been developed to encourage college students to increase their use of PBS (e.g., Dimeff et al., 1999; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990; Walters & Baer, 2006). These interventions differ in format and content; however in each case PBS use is assumed to be a mechanism by which interventions effect change in drinking and in the likelihood of experiencing negative alcohol-related consequences. This association reflects the roots of college drinking interventions in behavioral self-control training (e.g., Miller & Muñoz, 2005) and drinker's check-up intervention (Miller & Sovereign, 1989) designed for non-dependent problem drinkers.

Research on the effects of PBS use on alcohol consumption and alcohol-related consequences in college samples is active and growing. In the past decade, awareness of alcohol-related problems on college campuses has been rising (Perkins, 2002), and surveys like the National College Health Assessment ([www.acha-ncha.org](http://www.acha-ncha.org)) have become increasingly easy to administer on a large scale. These two factors combined with a new wave of motivation-enhancement alcohol interventions targeting college drinkers (e.g., Dimeff et al., 1999; Walters & Baer, 2006) have facilitated an escalation in research on protective behavioral strategies for reducing alcohol-related harm (e.g., Martens, Pedersen, LaBrie, Ferrier, & Cimini, 2007; Sugarman & Carey, 2007). PBS are often included in brief motivational interventions (BMI) with college students as part of the goal setting or planning phase (e.g., Dimeff et al., 1999). Brief interventions work to initiate natural change processes (Davidson, 1991), with the assumption that individuals have the skills necessary to alter their drinking. However, assessment of the relationship between PBS use and alcohol-related negative consequences, the relationship between PBS use and alcohol consumption, and experimental research of PBS as a mechanism of change, has revealed inconsistent findings.

This review is composed of two sections, (a) a review of the measurement instruments and methodological issues, and (b) a review of the

empirical literature assessing the relation among PBS use, alcohol consumption, alcohol-related consequences, and other relevant covariates. This review seeks to uncover methodological issues that play a part in the inconsistent link between protective behavioral strategy use and alcohol use and alcohol related consequences. Through a better understanding of the methodological issues in the assessment of PBS that may contribute to the inconsistent relations between PBS and outcomes we can begin to improve on the existing knowledge base. This review will offer suggestions and future directions for research aimed at the goal of improving our understanding of the way PBS function to reduce alcohol use and consequences among college students.

The construct of PBS for the reduction of alcohol involvement (i.e., alcohol consumption and alcohol related consequences) is studied in two contexts, (a) in correlational survey studies and (b) in intervention efficacy and outcomes studies. Correlational surveys typically assess use of a discrete list of protective behavioral strategies; students are asked to report the frequency with which they use each strategy. Strategy use is then correlated with alcohol use measures. With regard to alcohol use interventions, the majority of efficacy studies evaluate face-to-face brief motivational interventions and computer-based interventions. Face-to-face interventions typically use a list of PBS in the context of a personalized discussion of their use to facilitate students actively selecting the specific strategies that will best suit their needs. Computer based interventions typically provide some general (i.e., not personalized) tips for safer drinking (Carey, Scott-Sheldon, Elliott, Bolles, & Carey, 2009).

### 1.1. Correlational evidence of PBS and alcohol involvement

The association between PBS use and alcohol-related consequences is central to behavioral self-regulation theories that inform clinical interventions for alcohol use problems (Carey & Maisto, 1985). Fourteen studies have demonstrated some degree of support for a negative relationship between PBS use and alcohol-related consequences, with greater use of PBS associated with fewer alcohol-related negative consequences (i.e., Arass & Adams, 2008; Benton et al., 2004; Collins, Koutsky, Morsheimer, & MacLean, 2001; Delva et al., 2004; LaBrie, Kenney, & Lac, 2010; Lewis, Rees, Logan, Kaysen, & Kilmer, 2010; Luebbe, Varvel, & Dude, 2009; Martens et al., 2004, 2005, 2007; Palmer, McMahon, Rounsaville, & Ball, 2010; Ray, Turrisi, & Peters, 2009; Werch, 1990; Werch & Gorman, 1988). Werch (1990) demonstrated that the inverse relationship between PBS use and alcohol-related consequences only held for women. Since the publication of that study, six additional studies have confirmed that females use PBS more consistently than males (i.e., Benton et al., 2004; Delva et al., 2004; LaBrie, Lac, Kenney, & Mirza, 2011; Lewis et al., 2010; Palmer, McMahon, Rounsaville, & Ball, 2010; Walters, Roudsari, Vader, & Harris, 2007). In fact, only one study that tested for gender differences in PBS use found no gender differences in PBS use (Lewis, Rees, & Lee, 2009). One potential explanation for these gender effects offered by Walters and colleagues is that female students are more acutely aware of the need for self-protection than male students. This implies that female students may be more naturally inclined to use protective behavioral strategies than male students. Interventions could make use of these findings by affirming females' natural drive for self-protection and educating males on the risks they might experience as a result of high volume drinking.

In contrast to studies that show a negative concurrent association between PBS use and alcohol-related consequences, Luebbe et al. (2009)

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