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Do Students Use Contextual Protective Behaviors to Reduce Alcohol-Related Sexual Risk? Examination of a Dual-Process Decision-Making Model

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Abstract

Objective—Recent studies suggest drinking protective behaviors (DPBs) and contextual protective behaviors (CPBs) can uniquely reduce alcohol-related sexual risk in college students. Few studies have examined CPBs independently, and even fewer have utilized theory to examine modifiable psychosocial predictors of students' decisions to use CPBs. The current study used a prospective design to examine 1) rational and reactive pathways and psychosocial constructs predictive of CPB use, and 2) how gender might moderate these influences in a sample of college students.

Method—Students (n = 508) completed web-based baseline (mid-spring semester) and 1- and 6-month follow-up assessments of CPB use; psychosocial constructs (expectancies, normative beliefs, attitudes, and self-concept); and rational and reactive pathways (intentions and willingness). Regression was used to examine rational and reactive influences as proximal predictors of CPB use at the 6-month follow-up. Subsequent path analyses examined the effects of psychosocial constructs, as distal predictors of CPB use, mediated through the rational and reactive pathways.

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Results—Both rational (intentions to use CPB) and reactive (willingness to use CPB) influences were significantly associated with increased CPB use. The examined distal predictors were found to effect CPB use differentially through the rational and reactive pathways. Gender did not significantly moderate any relationships within in the model.

Discussion—Findings suggest potential entry points for increasing CPB use that include both rational and reactive pathways. Overall, this study demonstrates the mechanisms underlying how to increase the use of CPBs in programs designed to reduce alcohol-related sexual consequences and victimization.

Alcohol-related sexual consequences and victimization occur at alarmingly high rates on college campuses (Abbey, 2002; Fisher, Cullen, & Turner, 2000). Intervention efforts have targeted alcohol reduction as a mechanism for reducing the sexual risk associated with drinking (e.g., Clinton-Sherrod, Morgan-Lopez, Brown, McMillen, & Cowells, 2011; Testa, Hoffman, Livingston, & Turrisi, 2010). Although these efforts have demonstrated consistent efficacy in decreasing alcohol consumption, reductions in sexual risk have been small and less consistent. Sexual behavior is inherently interpersonal, and the majority of campus-based assaults occur between individuals who know each other (Abbey, Ross, McDuffie, & McAuslan, 1996). intervention efforts may have stronger direct effects if they include protective mechanisms that reduce the risk associated with the social contexts in which drinking and sex occur (Mallett, Marzell, & Turrisi, 2011).

Contextual Protective Behaviors

Previous work has shown protective behaviors can effectively reduce a number of harms associated with drinking, including sexual consequences (e.g., Ray, Turrisi, Abar & Peters, 2009). Although protective behaviors can include strategies that either decrease one's level of intoxication (e.g., pacing or limiting alcohol consumption; alternating alcoholic and non-alcoholic drinks) or target social and environmental elements of the context where drinking occurs (e.g., walking home with trusted friends; communicating sexual boundaries), protective strategies are often measured as a collective construct (e.g., Delva et al., 2004; Martens, Ferrier, & Cimini, 2007). However, Mallett and colleagues (2015) have found a unique direct association between contextually based protective behaviors (CPBs) and decreased sexual risk, even after accounting for drinking and other protective behavior use. Further, CPBs have been used with good success in risk-reduction and self-defense interventions to reduce rates of victimization (Orchowski, Gidycz, & Raffle, 2008). Despite their potential to reduce the sexual risk associated with the social environments in which individuals drink (Lewis, Rees, Logan, Kaysen, & Kilmer, 2010; Moore & Waterman, 1999), few studies have identified the modifiable variables needed to further enhance sexual risk prevention programs aimed at increasing CPB use. Thus, the goal of the current study was to systematically examine the theoretical determinants that influence students' decisions to engage in CPB use.

Rational and Reactive Processes for Decision Making: Examining Intentions and Willingness as Proximal Predictors of CPB Use

Dual-process models of cognition posit decisions are made using two different paths that operate simultaneously (e.g., Chaiken & Trope, 1999). These models differ slightly across disciplines and use a variety of labels (for a review, see Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008), yet there is agreement that one path involves a systematic, reasoned process while the other involves a more heuristic, socially-driven, reactive process. Research examining dual-processes of health behavior decision-making has primarily drawn from two theoretical approaches, namely the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and the Prototype-Willingness model (PWM; Gerrard et al., 2008). The TRA states behavior is a function of reasoned or rational processes, and at the forefront is behavioral *intention.* According to the TRA, behavioral intention is the proximal predictor of performing a behavior, through which all other predictors (attitudes and subjective norms) are mediated (for review, see Fishbein & Ajzen, 2010). The PWM also contends rational processes are mediated through intentions; however, the PWM introduces behavioral *willingness* (openness to engage in the behavior) as a reactive proximal predictor of behavior, through which more distal psychosocial antecedents (e.g., attitudes, subjective norms, risk images) are mediated (see Gerrard et al., 2008). For example, Gibbons, Gerrard, Ouellette, and Burzette (1998) found that both intentions and willingness predicted unique variance in smoking, and several studies have supported the role of the reactive path in predicting adolescent risk behaviors, such as drinking and unprotected sex (e.g., Gerrard, Gibbons, Gano, & Vande Lune, 2005; Thornton, Gibbons & Gerrard, 2002). In fact, there is evidence to suggest that models incorporating dual-processing elements are more effective at changing and explaining health behaviors compared to models that only focus on rational decision-making (Gibbons, Houlihan & Gerrard, 2009). Thus, the current study's first aim was to examine both the rational (intentions) and the reactive (willingness) processes influencing CPB use. While it was expected that intentions and willingness would share some common variance (e.g., someone intending to use CPBs is likely to also be willing; Gerrard et al., 2008), it was hypothesized each construct would also have a unique influence on CPB use. For example, some individuals may not intend to use CPBs, but they might be willing to if they happen upon a situation that requires it. Based on research showing intention tends to be strongly associated with health promoting behaviors (Cho, Keller & Cooper, 1999; Larabie, 2005), it was expected intentions would have a stronger positive relationship with CPB use relative to willingness.

Distal Predictors of CPB Use

The second aim of the present study was to identify modifiable psychosocial predictors of CPB use, which may be mediated through rational and reactive pathways. The TRA and the PWM refer to these as *distal* antecedents of behavior (because they function through the dual process mediators), and together suggest four classes of psychosocial predictors that have strong empirical and theoretical support: attitudes, expectancies, subjective norms, and risk images (Guilamo-Ramos, Jaccard, Dittus, Gonzalez, & Bouris, 2008; Jaccard, Dodge, & Dittus, 2002; Martens et al., 2004). Collectively, these constructs may represent different

motives for performing a behavior (e.g., Kuntsche, Knibbe, Gmel, & Engels, 2005); however, in terms of informing intervention, each construct highlights a different target for behavior change. For example, changing how an individual feels about performing the behavior (attitudes) and changing what one believes to be a potential outcome of performing the behavior (expectancies) would require different intervention approaches. Further, these constructs have been central explanatory concepts across the literature examining risk behavior, health behavior, and intervention efficacy (e.g., Scaglione, Turrisi, Cleveland, Mallett, & Comer, 2013; Turchik & Gidycz, 2012; Turrisi, Abar, Mallett, & Jaccard, 2010). Given their respective roles in the TRA and the PWM, it is expected some distal predictors will have stronger associations with the rational pathway, while others will exert their effects through the reactive pathway. Each class of hypothesized distal predictors will now be discussed in turn.

Attitudes

Attitudes are the positive and negative feelings about performing a behavior (Ajzen & Fishbein, 2011; Ekman & Davidson, 1994). Both the TRA and the PWM highlight attitudes as a significant distal predictor of behavior. This relationship has been demonstrated across a variety of risky and pro-health behaviors such as alcohol and marijuana use, delivery of smoking cessation programs, and condom use (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; McCarty, Hennrikus, Lando, & Vessey, 2001; Stacy, Bentler, & Flay, 1994). Within the protective behavior literature, positive attitudes toward using protective behaviors have been associated with increased use (Ray et al., 2009). Given their central role in both the TRA and the PWM, it is anticipated attitudes will demonstrate strong effects on CPB use through both the rational (intentions) and reactive (willingness) pathways.

Expectancies

Also referred to as behavioral beliefs, expectancies refer to the perceived outcomes of performing a given behavior. For example, Orchowski, Untied, and Gidycz (2012) demonstrated that women who believed protective strategies would reduce their sexual risk were more likely to use those strategies in risky environments. The positive outcome most frequently assessed is perceived effectiveness of the behaviors, which has been associated with increased protective behavior use in the context of reducing alcohol-related consequences (Ray et al., 2009). Within the TRA, expectancies are posited to inform one's attitudes (Ajzen & Fishbein, 1980); however, more recent work has demonstrated direct associations between expectancies and intentions, supporting the examination of both attitudes and expectancies within the same plane of distal predictors (e.g., Jaccard et al., 2002). Given the established association with intentions, it is hypothesized expectancies will exert their effect on CPB use through the rational pathway (intentions). Due to a dearth of literature examining associations between expectancies and willingness, our examination of this pathway is exploratory.

Subjective Norms

This class of variables refers to the notion that individuals are more likely to engage in a behavior if they feel normative pressure or support to do so. This relationship has been the focus of a large body of work examining college student drinking (e.g., Borsari & Carey,

2001; Lewis & Neighbors, 2006; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Subjective norms can refer to perceptions of what others are doing (descriptive norms) or perceptions about the level of others' approval of a given behavior (injunctive norms) (Cialdini, 2003). Ajzen and Fishbein (1980) assert the likelihood individuals will engage in behavior is partially determined by their motivation to comply with these perceived norms, focusing primarily on peer approval. However, both descriptive and injunctive norms have been positively associated with both rational and reactive processes in predicting behaviors such as smoking and engaging in unprotected sex (Gibbons & Gerrard, 1995). Given the social nature of normative beliefs, it is hypothesized they will have a stronger influence on CPB use through the reactive pathway (willingness).

Risk Avoiding Images and Self-Concept

The PWM introduces the notion that the reactive pathway (willingness) is influenced by risk images, or perceptions of the type of person who engages in a risk behavior (e.g., the typical drinker; Gerrard et al., 2008; Setterlund & Neidenthal, 1993). Individuals make decisions about whether to engage in a behavior based on the perceived social consequences of doing so. Gerrard and colleagues (2002) applied this concept to risk aversion by differentiating between images of risk takers (e.g., drinkers) and risk avoiders (e.g., drinking abstainers) and found that risk-avoiding images were often viewed more positively. CPBs fit well into this model of risk aversion, specifically when they are used in the context of reducing alcohol-related sexual risk. Self-concept goes one step further, referring to how individuals evaluate themselves relative to the prototypical person who engages in the behavior and how that relates to the image they hope to convey to others (Gerrard et al., 2008; Wills, Gibbons, Gerrard, Murry, & Brody, 2003). If performing a certain behavior is perceived as being counter to an individual's desired image, it is less likely the behavior will be performed (Guilamo-Ramos et al., 2008). The current study examined self-concept (combining risk avoiding images with perception of self, relative to image) as a distal predictor of both rational and reactive processes associated with CPB use. Given self-concept is a socially based construct and has been previously associated with increased willingness (Wills et al., 2003), it is hypothesized self-concept will exert its effect on CPB use through the reactive pathway (willingness). Self-concept's influence within the rational pathway (intentions) is exploratory.

Accounting for Previous Behavior

The TRA and the PWM acknowledge previous behavior as an important antecedent, influencing one's intentions and willingness to engage in the behavior (Ajzen & Fishbein, 1980; Bagozzi, 1981; Connor & Abraham, 2001). Because CPBs are meant to be used in contexts where individuals drink and socialize, individuals' drinking and social behaviors are particularly relevant. For example, individuals who do not drink or engage in social settings where drinking occurs may not have the need to use CPBs and will, in turn, report lower CPB use. As such, previous drinking and CPB use were included as covariates to control for their global effects on intentions and willingness, allowing the current study to focus on identifying *modifiable* psychosocial predictors of CPB use.

The Current Study

The goal of the current study was to systematically examine a dual-process model of CPB use in college students using a theory-based longitudinal framework. To achieve this goal, the first aim examined both reasoned (measured by intentions) and reactive (measured by willingness) influences as unique proximal predictors of CPB use. The second aim, informed by behavioral decision-making theories and past empirical research, sought to examine distal psychosocial predictors of CPB use that function through rational and/or reactive pathways. The hypothesized theoretical framework is depicted in Figure 1. Finally, the research examined potential gender differences in the relationships between the constructs and in the prediction of CPB use, as path differences may suggest the need for different approaches to prevention. Past research examining the decision theoretic constructs has not provided substantial evidence to warrant strong hypotheses with regard to gender. Thus, this aspect of the present study is exploratory. By extending the research to include a comprehensive theoretical examination of precursors to CPB use, the present study will help inform prevention efforts focused on increasing students' use of CPBs to reduce alcohol-related sexual risk.

Methods

Recruitment and Participants

College students attending a large public university in the Northeastern US were invited to participate in a three-wave longitudinal study assessing protective behavior use and drinking in social settings. To be eligible, participants had to be of freshman, sophomore or junior status upon enrollment, as the study's longitudinal design included following students from March 2012, over the summer, and into the following fall semester. A total of 900 students who met eligibility criteria were randomly selected from the university registrar's database. These students were sent a pre-notification letter and a subsequent e-mail inviting their participation in the study, explaining compensation, and containing a URL and Personal Identification Number (PIN) to access the online baseline survey. Non-responders received up to five reminder emails. These same procedures were used for both follow-up assessments, which took place one month (April) and six months (September) post-baseline, respectively. Participants were paid $30 for completing the baseline survey and $15 for each of the two follow-up surveys. All study procedures were reviewed and approved by the university's Institutional Review Board.

Approximately 56% of invited students completed the baseline survey (n = 508), which is consistent with other web-based approaches (Larimer et al., 2007; McCabe, Boyd, Young, Crawford, & Pope, 2005; Thombs, Ray-Tomasek, Osborn, & Olds, 2005). The study had high retention rates across waves two (88%; N=447) and three (81%; N = 412), with no evidence of attrition bias related to baseline demographic variables or CPB use (all $p > .05$). At baseline, participants had a mean age of 19.57 (SD=2.91) years, and half of the sample identified as female (50.1%). A variety of ethnic and racial backgrounds were represented (78.9% Caucasian, 11% Asian, 4.5% African American, and 5.6% multi-racial or other), with a small proportion of participants identifying as non-white Hispanic (6.9%). All sampled school statuses were adequately represented (37% freshmen, 35% sophomores, and

28% juniors), and these proportions remained stable across both follow-up surveys. All sample characteristics were representative of the population demographics at the university where the study took place.

Measures

To examine the hypothesized mediational framework, all demographics, distal predictors and covariates were measured at T1, proximal predictors (intentions and willingness) were assessed at T2, and CPB use was measured at T3. Specific measures for each construct are described in detail below.

All measures related to CPBs were adapted from the Dating Self-Protection Against Rape Scale (DSPARS; Moore & Waterman, 1999), previously validated in a sample of college students similar to the sample in the current study. However, to insure item relevance to current college students, the original 15-item scale was pilot-tested in a general studies undergraduate course (n = 85), where students were offered extra credit for participating. Items endorsed as *never* being used by at least 80% of the sample were removed from the scale, as they demonstrated little or no variability. Items regarding self-defense (e.g., use of self-defense strategies, household objects, or weapons) were highly correlated but rarely endorsed. Thus these three items were combined into a single item about self-defense. The final revised scale consisted of the 12 most modal DSPARS items (including the revised self-defense item), and an additional item that asked students about knowing where their drink had been. These 13 items grouped together in a single CPB factor (factor loadings > .60; $\alpha > .80$). All 13 items were used in their original form to assess actual CPB use. To assess proximal and distal predictors of CPB use (intentions, willingness, attitudes, expectancies, subjective norms, and self-concept), the 13 items remained in their original form, but the question stems changed to reflect each psychosocial construct (described below). This method is consistent with the level of measurement specificity recommended by Fishbein and Ajzen (2010).

Contextual Protective Behavior Use—CPB use was measured at T1 (baseline covariate) and T3 (main outcome), approximately six months after baseline. For the main outcome measure, students were asked to report how often they used each of the 13 CPBs in the past five months (i.e., since T2) using a 5-point scale ranging from *Never* (0) to *Always* (4). At baseline, these same questions were asked with a recall period of approximately eight months (i.e., since the beginning of that school year). Sample items included, “How often did you…Let a friend or family member know where you were and whom you were with… Meet in a public place instead of a private place… and Make sure you knew where your drink had been at all times?” A complete list of all 13 items can be found in Table 1. For the main study aims, the items were summed to create an overall index of CPB use ($\alpha = 0.92$).

Proximal Predictors of CPB Use

Intentions and willingness to use CPBs: Measured at T2, behavioral intentions and willingness were the theoretical constructs used to measure rational and reactive influences on CPB use, respectively. First, participants were given instructions to think about the extent to which they intended to use CPBs in social situations where they (or others) may be

drinking. Next they were presented with the prompt, "Over the next 5 months, I intend to… [*Protective Behavior*]." Similar instructions and questions were used to assess willingness. Students were asked to think about the extent to which they were willing to use each behavior in social situations where they (or others) may be drinking. These instructions were followed with the prompt, "Over the next 5 months, I am willing to…[*Protective Behavior*]." Response options for both constructs ranged from *Strongly Disagree* (−2) to *Strongly Agree* (+2), and both scales were summed to create composite scores for rational (intentions; $\alpha = 0.94$) and reactive (willingness; $\alpha = 0.94$) constructs.

Distal Predictors of CPB Use

Attitudes: A composite score of attitudes toward CPB use was created by assessing how students felt towards engaging in each of the 13 protective behaviors ($\alpha = 0.93$). Students responded on a 5-point scale, ranging from *Extremely Negative* (−2) to *Extremely Positive* (+2).

Expectancies: Expectancies were measured by asking students to evaluate the expected effectiveness of each of the 13 CPBs in reducing their alcohol-related sexual risk. For example, participants used a 5-point scale to indicate their level of agreement with the statement " [*Protective Behavior*] helps me decrease my risk of unwanted sexual experiences in situations where I am (or others around me are) drinking." Responses from the 13 behaviors were summed to create an index of CPB expectancies ($\alpha = 0.92$).

Subjective norms: Normative beliefs were measured by assessing students' perceived "closest friend" CPB use and approval of CPB use. First, students reported how frequently they believed their closest friend engaged in each of the 13 CPBs, using a 5-point scale ranging from *Never* (0) to *Always* (4). The items were summed to create a composite score of descriptive norms ($\alpha = 0.92$). Injunctive norms were assessed using a 5-point scale, ranging from *Strongly Disapprove* (−2) to *Strongly Approve* (+2). Students were asked to indicate how much their closest friend would approve of them using each of the CPBs in social situations where they, or others, were drinking ($\alpha = 0.95$).

Self-concept: An indicator of self-concept was created by using two items to assess positive perceptions of a risk avoidant image (someone who uses CPBs) and one's perceived similarity to that image. Using a 5-point scale, ranging from *Strongly Disagree* (−2) to *Strongly Agree* (+2), students were asked to indicate how much they agreed or disagreed with the following statements: 1) "Overall, my impression of people who use protective behaviors is positive," and 2) "In general, I would consider myself to be the type of person who uses protective behaviors while in social situations where I, or others, may be drinking." Responses from these two items were summed for an overall self-concept score ($\alpha = 0.77$; $r = 0.63$, $p < .001$).

Drinking: Drinking was included as an additional covariate and assessed using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Students reported the number of drinks they consumed on each day of a typical week within the past 30 days.

Responses were summed across days to provide a composite score of typical weekly drinks consumed (α = 0.79; *M* = 10.62, *SD* = 11.72).

Analytic Procedures

Preliminary Analyses—Prior to examination of the hypothesized models, descriptive statistics were used to gain a more general understanding of CPB use within the sample. First, means, standard deviations, and frequency of regular use (defined by "usually" or "always" using the behavior) were examined for each behavior individually. Next, independent samples t tests were used to examine differences among males and females in overall CPB use and all examined distal and proximal predictors.

Aim 1: Examining Rational and Reactive Constructs as Proximal Predictors—Step-wise regression was used to examine the unique effects of rational and reactive constructs on CPB use. First, the overall CPB use index was regressed onto the rational construct (intentions to use CPBs). In the second step, the reactive construct (willingness to use CPBs) was added to the model. Individual path estimates and changes in R^2 were examined for significance.

Aim 2: Examining Distal Predictors of CPB Use Mediated through Rational and Reactive Pathways—In preparation for examining the hypothesized model (see Figure 1), zero-order correlations were used to examine the relations between CPB predictors and CPB use. Appropriate outlier adjustments (using ± 3.29*SD) were made to any non-normally distributed variables before hypotheses were tested (Tabachnick and Fidell, 2001). To test the proposed theoretical framework, a path model was estimated using the statistical package Mplus (v 6.2). Missing responses were minimal (< 5% on any variable) and addressed using Full Information Maximum Likelihood (FIML), the default missing data method applied by Mplus. All variables were centered before analyses were performed and participant's age was included as an additional covariate to control for maturation processes. To further control for any non-normally distributed variables (e.g., typical weekly drinking), the maximum-likelihood robust (MLR) estimator was utilized.

Using a path model, CPB use was regressed onto the hypothesized rational (intentions) and reactive (willingness) constructs, which in turn were regressed onto attitudes, expectancies, subjective norms, self-concept, and covariates (age, drinking and T1 CPB use). Global model fit indices (x^2, CFI, RMSEA) were examined to determine overall model fit (Hooper, Coughlan, & Mullen, 2008), and the joint significance test was used to examine mediation effects within the model (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). The joint significance test implies significant mediation if both the α path (the effect of the predictor on the mediator) and the β path (the effect of the mediator on the outcome) are statistically significant. The effect size of the mediated relationship is the product of both path coefficients (αβ). All estimated α and β paths used in mediation analyses are labeled in Figure 1. Bootstrapped asymmetrical confidence intervals were used to further assess the significance of the mediated effects, such that a mediated effect was considered to be significant if the 95% confidence interval range did not include the value of zero. Bootstrapping provides an additional "check" of estimator properties in "less than ideal

conditions" (i.e., when the sampling distribution is not assumed to be normal) (Bollen & Stine, 1990, pg. 115), or when estimating the sampling distribution for indirect effects (Preacher & Hayes, 2008).

Aim 3: Examining Gender as a Moderator—To determine whether there were differences between males and females within the hypothesized model, a two-group solution was examined. Two nested models (one with all paths freely estimated and one fully constrained) were compared for model invariance across gender. To account for non-normally distributed variables, model fit was evaluated with the Satorra-Bentler scaled chi-square statistic (SB χ^2) and using maximum-likelihood estimation with robust standard errors (MLR). Nested models were compared using a difference test scaling correction (cd), calculated from the ratio of normal theory to SB χ^2 test statistics (Satorra & Bentler, 2001). In this comparison, a significant reduction in chi-square, relative to change in degrees of freedom would indicate significantly worse fit for the more parsimonious (constrained) model relative to the freely estimated model. This omnibus result would indicate the two groups differed significantly on at least one path within the model and that additional model comparison is warranted. Similar procedures would then be employed to examine statistical differences between genders for individual paths.

Results

CPB Use Descriptive Statistics

Endorsements for all CPBs utilized the full response scale (0-4) and were all normally distributed. Means and standard deviations for each CPB can be found in Table 1. Participants indicated they were least likely to "Consider making a plan to use self-defense strategies or common/household objects against [their] current or potential dating partner if he/she were to become sexually aggressive," while they were most likely to "Make sure [they] knew where [their] drink has been at all times." There was significant variability in the rates at which behaviors were endorsed as being used "usually" or "always" (Table 1, column 2). For example, using self defense, trying not to be alone with a sexual partner, and making oneself aware of exits were among the least regularly endorsed, while watching one's drink, walking home with trusted friends, and making friends/family aware of one's whereabouts were the most regularly relied upon behaviors. Examination of the overall index revealed that CPB endorsement varied widely (Range: 0-54; $M = 29.39$, $SD = 12.37$), with females ($M = 33.18$, $SD = 11.46$) endorsing significantly higher rates of CPB use relative to males ($M = 24.84$, $SD = 11.91$), $t\ (407) = -7.20$, $p < .001$.

Aim 1: Examining Rational and Reactive Constructs as Proximal Predictors of CPB Use

The step-wise regression model revealed both rational and reactive constructs accounted for unique portions of variance in CPB use (F change $(1, 375) = 6.98$, $p = .009$) and together accounted for approximately 35% of the variance. More specifically, higher intentions and willingness at T2 were associated with higher overall CPB use at T3 ($B = .53$, $SE = .08$, $p < .001$, and $B = .25$, $SE = .09$, $p = .009$, respectively). Despite unique contributions to variance, an r-to-z transformation test revealed the strength of the association between intentions and CPB was not significantly stronger than the association between willingness and CPB. The

correlation between intentions and willingness was significant (r = 0.78), suggesting the potential for collinearity issues and the need to correlate these variables in subsequent analyses.

Aim 2: Examining Distal Predictors and Mediation Paths for CPB Use

Given the unique rational and reactive influences revealed above, both intentions and willingness (and the correlation between them) were included in all subsequent models. The zero-order correlations between proximal predictors, distal predictors and covariates, and CPB use, as well as means and standard deviations for each variable, can be found in Table 2. High zero-order correlations between distal predictors suggested the potential for collinearity; thus, all path models also estimated correlations between predictors. Path coefficients and significant mediation effects within the proposed framework are presented in Table 3. Examination of global fit indices suggested the model adequately fit the data, χ^2 (df= 8) = 44.25 $p < .001$, CFI = .96, RMSEA =.09. Examination of the distal predictors (α paths) revealed expectancies and attitudes had significant positive effects on intentions but not willingness. As expected, injunctive norms were positively associated with both intentions and willingness, while self-concept was significantly associated with only willingness. Descriptive norms were not significantly associated with either proximal construct. Examination of model covariates (not shown in table) revealed age and typical weekly drinking were not significantly associated with either pathway, whereas baseline CPB use significantly predicted both intentions (B = .20, SE = .05, $p < .001$) and willingness (B = .14, SE = .05, p = .004). Collectively, these distal predictors accounted for 46% and 44% of the variance in intentions and willingness, respectively. Examination of the proximal predictors (β paths) confirmed both intentions (β1) and willingness (β2) significantly predicted CPB use (R^2 = .34), with the relative strength of the rational influence (intentions; B = .50, SE = .09, $p < .001$) being nearly double the relative strength of the reactive influence (willingness; B = .26, SE = .11, p = .02). According to the joint significance test, both intentions and willingness mediated the effects of injunctive normative beliefs on CPB use. Meanwhile, expectancies and attitudes functioned primarily through the rational path (intentions), and self-concept functioned only through the reactive path (willingness). Examination of the bootstrapped confidence intervals supported these findings.

Aim 3: Examining Gender as a Moderator

Gender differences in endorsement of all examined model constructs can be found in Table 2. Model fit indices for freely estimated and fully constrained two-group solution models comparing men and women can be found in Table 4. The log likelihood difference test for gender indicated the constrained model did not have significantly worse fit than the freely estimated model, scaled χ^2 (18) = 14.106, $p > .05$. This suggested the more parsimonious model with all paths constrained to be equal for men and women was preferred, and that gender did not significantly moderate the overall model.

Discussion

The current study examined both the rates and predictors of CPB use among college students in order to better inform interventions targeting alcohol-related sexual

consequences and victimization. The Theory of Reasoned Action and the Prototype-Willingness Model are two established decision-making theories that have been independently utilized in college student behavioral interventions. The current study utilized a framework that combined the two theories to examine the dynamic relationship of intentions and willingness in predicting behavioral outcomes through rational and reactive pathways, respectively. As expected, both intentions and willingness significantly predicted CPB use, accounting for a combined large portion of the variance (35%). Although the effects of intentions and willingness on CPB use did not significantly differ from each other when tested independently, it should be noted that within the larger model, the relative strength of the rational influence (intentions) was nearly double that of the reactive influence (willingness), highlighting the planned nature of these behaviors (e.g., needing to make plans in advance to walk home with friends or tell people where you are headed). This finding is consistent with the health behavior literature, which posits pro-health behaviors tend to be more intentional or planned, while the reactive pathway tends to be a better predictor of health risk behaviors (Pomery, Gibbons, Reis-Bergan, & Gerrard, 2009; Spijkerman, van den Eijnden, Vitale, & Engels, 2004). However, the fact that the reactive path was also significant in the current study suggests that individuals might be more open to using CPBs in the spur of the moment, should the situation require it. Additionally, the correlation between rational and reactive constructs was high ($r = .78$), suggesting individuals who are willing to use CPBs may also be more mindful of actively planning to use them. Taken together, the findings suggest both rational and reactive pathways as potential entry points within existing prevention programs for increasing CPB use.

The second aim of the study examined distal predictors of CPB use. As expected, and consistent with their respective behavioral theories, expectancies influenced CPB use through the rational pathway, while self-concept influenced CPB use through the reactive pathway. In addition, injunctive norms influenced CPB use through both rational and reactive pathways. Contrary to our hypotheses, descriptive norms were not significantly associated with intentions or willingness, and attitudes only predicted intentions. Given the central roles of attitudes and subjective norms in both the TRA and the PWM (Fishbein & Azjen, 2010; Gerrard et al., 2008), it was expected attitudes and both types of norms would influence both pathways. Taken together, findings support the existence of dual-process framework, with expectancies and attitudes functioning through the rational, or intentional pathway, with self-concept functioning through the reactive, or willingness-driven pathway, and with injunctive norms functioning through both pathways. These findings also suggest psychosocial factors might be of different utility depending on which aspect of decision-making is addressed via intervention.

Lastly, we explored the role of gender in the hypothesized relationships between psychosocial predictors and CPB use. Although women used more CPBs and had higher endorsements on all predictors, findings suggested the rational and reactive processes that influence the decision to use CPBs are not different for men and women. This could have significant implications for programs that aim to specifically individualize content based on gender. For example, university-based programs designed to reduce sexual victimization frequently separate men and women, with the assumption that they require separate messages (Breitenbecher, 2001). However, a more global application of decision-making

skills and CPB awareness may be an effective addition to prevention programs aimed at increasing CPB use to reduce alcohol-related sexual risk.

Implications

Findings from this study have important implications for prevention-based programs, as alcohol-related sexual consequences and victimization remain prevalent among college students, regardless of gender (Hines, Armstrong, Reed, & Cameron, 2012; Larimer, Lydum, Anderson, & Turner, 1999). While the majority of these experiences involve alcohol, alcohol interventions alone are not sufficient for reducing related problems as they often include components of social interaction or environmental risk. Consistent with previous work (Smith et al., 2011), our findings show college students already endorse a wide variety of CPBs. Within the current study, eight out of 13 strategies were endorsed as being used regularly by more than half the sample. Perhaps an efficacious addition to current interventions would be to simply remind students of the most adaptable and useable CPBs, and to reinforce that what they are likely already doing is protecting them from potential risk. Findings further highlight that students not only plan to use CPBs, but they are also open to using them should they need to (independent of planning). Intervention efforts might try to shift individuals from reactive to more rational decision-making processes, increasing their active planning to engage in CPB use. However, given the significant influence of both pathways, interventions may also benefit from taking a dual-process approach that attempts to increase CPB use by altering both processes. For example, normative feedback may be a particularly useful tool given the dual influence of injunctive norms on both rational and reactive decision-making. Increasing perceptions of peers' approval of CPB use could increase individuals' planning and openness to use. In addition, motivational interviewing may be a useful avenue for helping students to develop more positive expectancies and attitudes toward CPB use, which in turn could also motivate increased CPB use.

Limitations and Future Directions

The current study added to the literature by prospectively examining rational and reactive pathways influencing students' decisions to use CPBs; however, it is not without limitations. First, although CPBs have been associated with decreased sexual risk (Mallett et al., 2015), there remain gaps in understanding how and when individuals use CPBs. Future work should prospectively examine patterns of CPB use across different contexts (e.g., at different levels of intoxication, with peers who are familiar vs. acquaintances, at parties vs. bars). Such an examination would also help identify whether certain CPBs are more efficacious than others, and whether individuals have the need and opportunity to use them. Second, in order to reduce respondent burden, the current study did not include a comprehensive measure of behavioral risk images and self-concept, which are a part of the Prototype-Willingness model. Future work should explore a wider variety of risk- and risk-avoidant images in addition to those examined here. Also in an effort to reduce respondent burden, the current study focused assessment of normative beliefs on one's "closest friend." While the closest friend referent has been supported within the literature (e.g., Larimer et al., 2009), it is likely men and women exhibit different sex-related behaviors. Future work might explore the utility of gender-specific normative referents in understanding students' decisions to use CPBs. Also of note was the high correlation between attitudes and

expectancies (r = .75). Although expectancies refer to anticipated outcomes and attitudes refer to feelings toward engaging in a behavior, there is likely some overlap in that people will feel more positively toward behaviors they perceive to have positive outcomes. This may be reflective of the original TRA framework, which posited expectancies were a predictor of attitudes. However, the current study and previous work (e.g., Jaccard et al., 2002) suggest both attitudes and expectancies account for unique variance in behavioral intentions, supporting their continued use as parallel predictors. An alternative explanation can be posited about measurement validity. The current study is the first to examine psychosocial predictors of CPB use. As such, there were no existing measures that assessed the specific constructs of intentions, willingness, attitudes, etc., related to CPBs. Although measures for this study were created based on Fishbein and Ajzen's principles of measurement specificity (2011), internal validity was high, and items were not correlated with measures of social desireability, it is unclear whether the high correlations discussed above are due to measurement (e.g., discriminant validity) or overlap in theoretical constructs. Future work should replicate findings, making comparisons with other measures that might approximate these constructs. Finally, the current study examined CPB use at the global level. While this is extremely helpful in terms of identifying predictors that might be targeted within interventions, future work should also examine CPB use within an event-level framework. For example, while the current study suggests that both rational and reactive constructs influence CPB use, prevention efforts would benefit from understanding how these factors vary across social and environmental contexts and at varying levels of intoxication.

Conclusions

In summary, while research on alcohol-related sexual consequences and victimization has identified decreases in drinking can reduce rates of unwanted sexual experiences (Testa et al., 2010), alcohol reduction alone is not sufficient for reducing risk associated with one's social context (Abbey et al., 1996). The present study examined college students' use of CPBs as well as psychosocial constructs that predict their use. The findings identified variables that can be targeted in intervention efforts to increase students' use of CPBs, which may be useful in reducing sexual risk, especially in situations that involve alcohol.

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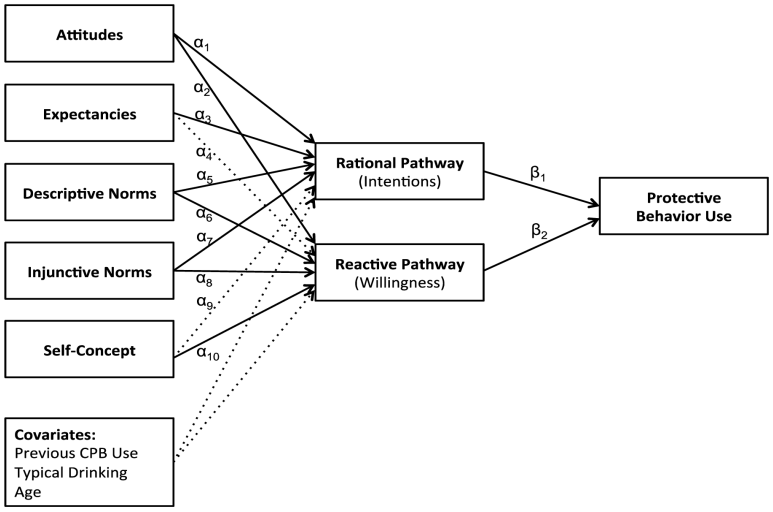

Figure 1.

Hypothesized Theoretical Framework of Rational and Reactive Pathways Predicting Contextual Protective Behavior Use

Note. Dotted paths are exploratory/have no a priori hypotheses.

Table 1

Means (SD) and Endorsements (%) of Contextual Protective Behavior Use

How often do you…?	***M (SD)*** **(Range: 0-4)**	**% Who Endorse Regular Use**
1. Make sure you know where your drink has been at all times	3.13 (1.22)	80.2
2. Have a trusted friend(s) be with you or walk home with you	2.78 (1.18)	72.4
3. Let a friend or family member know where you are and whom you are with	2.77 (1.18)	67.9
4. Provide for your own transportation so you do not have to depend on someone else	2.62 (1.25)	64.5
5. Carry enough money with you to get a taxi in case of on emergency	2.61 (1.36)	61.4
6. Pay attention to your potential dating or sexual partner's alcohol/drug intake	2.45 (1.37)	57.7
7. Communicate your sexual boundaries directly and assertively to potential dating sexual partners	2.41 (1.49)	55.7
8. Try to be aware of where other people are who may be able to help you in case of an emergency	2.25 (1.36)	51.8
9. Meet in a public place instead of a private place	2.08 (1.36)	42.3
10. Talk to people who know your potential dating or sexual partner to find out what he/she is like	1.98 (1.48)	42.1
11. Make yourself aware of exits from the area where you and a potential dating or sexual partner might be	1.70 (1.47)	33.5
12. Try not to be alone with a potential dating or sexual partner	1.61 (1.47)	31.5
13. Consider using self-defense strategies or common/household objects against your current or potential dating partner if he/she were to become sexually aggressive	0.99 (1.36)	18.3

Note. M = Mean; SD = Standard Deviation; Regular Use is defined as a behavior which is endorsed as being used "usually" or "always."

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Table 2

Zero-Order Correlation Matrix, Means, and Standard Deviations for Contextual Protective Behavior (CPB) Use and Theoretical Predictors For the Overall Sample and by Gender

		1	2	3	4	5	6	7	8
1. T3 CPB Use		1.00							
2. Intentions to use CPB		.57*	1.00						
3. Willingness to use CPB		.52*	.78*	1.00					
4. Attitudes		.47*	.55*	.59*	1.00				
5. Expectancies		.39*	.48*	.52*	.75*	1.00			
6. Descriptive Norms		.40*	.44*	.46*	.51*	.43*	1.00		
7. Injunctive Norms		.40*	.57*	.56*	.73*	.61*	.59*	1.00	
8. Self-Concept		.33*	.46*	.43*	.55*	.50*	.39*	.52*	1.00
	Mean (SD)	29.39 (12.37)	10.82 (10.61)	28.72 (8.60)	13.20 (9.37)	14.45 (10.59)	30.50 (9.97)	13.13 (9.69)	2.45 (1.40)
Females:	Mean (SD)	33.18 (11.46)	14.64 (9.26)	31.87 (7.52)	17.37 (7.51)	18.72 (7.86)	33.04 (9.04)	17.32 (8.05)	2.85 (1.14)
Males:	Mean (SD)	24.84 (11.91)	6.26 (10.32)	24.97 (8.49)	8.93 (9.13)	10.09 (11.20)	27.75 (10.03)	8.81 (9.30)	2.03 (1.52)
	t-test[a]	7.20**	8.97**	8.99**	11.32**	10.02**	6.21**	10.98**	6.85**

Note.

* $p < .05$,

** $p < .001$.

[a] t-test examined significant differences between males and females.

Table 3

Path Coefficients (Standard Errors) and Significant Mediation Effects for Hypothesized Model

Predictor	Predictor Effect on Mediator (α paths)	Mediator Effect on CPB Use (β paths)	Mediated Effect (αβ)	Lower CI of Mediated Path	Upper CI of Mediated Path
Attitudes (α1)	0.20 (0.08)*	(β1) 0.50 (0.09)**	0.10	0.02	0.20
(α2)	0.08 (0.08)	(β2) 0.26 (0.11)*			
Expectancies (α3)	0.13 (0.06)*	(β1) 0.50 (0.09)**	0.06	0.01	0.13
(α4)	0.06 (0.07)	(β2) 0.26 (0.11)*			
Descriptive Norms (α5)	0.07 (0.05)	(β1) 0.50 (0.09)**			
(α6)	0.04 (0.04)	(β2) 0.26 (0.11)*			
Injunctive Norms (α7)	0.21 (0.06)**	(β1) 0.50 (0.09)**	0.10	0.04	0.19
(α8)	0.25 (0.06)***	(β2) 0.26 (0.11)*	0.06	0.01	0.14
Self-Concept (α9)	0.70 (0.38)	(β1) 0.50 (0.09)**			
(α10)	1.05 (0.33)**	(β2) 0.26 (0.11)*	0.27	0.05	0.67

Note.

CPB = Contextual Protective Behaviors. CI = Confidence Interval; All CI estimates are based on a 95% CI. All α and β paths correspond to labeled paths in Figure 1.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Table 4

Fit Indices for Freely Estimated and Constrained Models Testing Gender Effects

Model	X^2 (df)	p	RMSEA	CFI	AIC	BIC	LL (scaling factor)
Freely estimated beta paths	39.71 (16)	<0.001	0.077	0.95	32753.70	33336.69	−16238.85 (1.26)
Constrained beta paths	53.30 (34)	0.02	0.047	0.96	32735.42	32861.49	−16247.71 (1.26)

Note. Scaled χ^2 (18) = 14.106, $p > .05$

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