

# Protective behavioral strategies for sexual aggression and risky sexual behavior

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## Funding information

National Institute on Alcohol Abuse and Alcoholism, Grant/Award Number: R34 AA027713

## Abstract

Sexual aggression (SA) is a serious public-health problem on college campuses, and there is a pressing need for basic research fostering the development of novel prevention strategies. The current study (a) developed measures of protective behavioral strategies (PBS) for sexual aggression (SA) and risky sex (RS); (b) characterized college men's PBS use; and (c) evaluated whether those who reported engaging in SA and RS showed lower PBS use. Undergraduate men from two universities ( $n = 567$ ) who endorsed sexual attraction toward women completed measures of PBS, SA, RS, rape-supportive and sociosexual attitudes, and alcohol consumption. On average, participants reported using PBS for SA and RS fairly often, but a sizeable number indicated that they seldom or never used the strategies. Men who reported SA engagement in the last year, relative to their peers, endorsed sharply lower reliance on SA PBS and RS PBS. Men who reported at least one RS behavior in the last year used RS PBS far less often than their peers. The PBS measures converged as expected with other attitudinal and behavioral measures. The new PBS measures reference cognitive-behavioral approaches that a large percentage of college men use on a regular basis, making them potentially acceptable prevention targets. Further, men at greater risk of exhibiting SA are much less likely to take steps to reduce the risks associated with sexual behavior, in comparison with their peers. Thus, future work could evaluate the potential usefulness of incorporating PBS for SA and RS into primary prevention programming in both domains.

## KEYWORDS

alcohol, protective behavioral strategies, risky sex, sexual aggression

Male-initiated sexual aggression (SA) toward female acquaintances is a serious public-health problem on college campuses in the United States. Approximately 20%–25% of women are sexually assaulted by a man during college, and acquaintances commit the overwhelming majority of assaults (Cantor et al., 2019; Krebs et al., 2007; Muehlenhard et al., 2017). Current prevention approaches provide inadequate reduction of SA (DeGue et al., 2014; Newlands & O'Donohue, 2016), and a recent review suggests that they may be iatrogenic for higher-risk males (Malamuth et al., 2018). Thus, there

is a pressing need for basic research that could lead to the development of novel prevention strategies. The current work develops and conducts a preliminary evaluation of measures of protective behavioral strategies (PBS) for perpetration of SA and a related phenomenon, risky sex (RS), which also is common among college students and is a well-established risk factor for SA (Davis et al., 2018; Turchik et al., 2015).

Martens et al. (2004) first suggested that PBS might be useful for reduction of hazardous drinking among college students.

They defined PBS as “behaviors that individuals can engage in while drinking alcohol in order to limit negative alcohol-related consequences” (p. 390). Martens et al. (2004), as well as Benton et al. (2004), demonstrated that college students who engaged in more of these active cognitive-behavioral responses reported experiencing fewer negative alcohol-related consequences. Martens et al. (2005) showed that PBS use was negatively related to alcohol-related problems, and Treloar et al. (2015) demonstrated that PBS predicted both concurrent and future negative consequences.

Overall, numerous studies have demonstrated that PBS use is related inversely to alcohol consumption and problems (see Pearson, 2013, for a review). College students also underestimate the typical student's reliance on drinking-related PBS (Benton et al., 2008; Lewis et al., 2014). As a result, education and normative feedback on PBS use have been incorporated into brief intervention efforts. In a review of all randomized trials aiming to reduce college student drinking, Reid and Carey (2015) reported that PBS use emerged as a reliable mediator of treatment effects in 6 of 12 relevant trials. Interestingly, all 4 trials that provided normative

feedback on PBS use, rather than simply reviewing PBS strategies, showed reliable mediation effects. These findings suggest both the potential utility of incorporating PBS normative feedback into prevention efforts, as well as the need for continued efforts to increase the impact of treatment strategies on PBS use.

PBS measures have been developed for condom use (Lewis et al., 2009a) and sexual victimization among women (Moore & Waterman, 1999), but not for perpetration of SA or a broad range of RS behaviors. Thus, the current work aims to develop such measures; to characterize their factor structure; and to evaluate whether PBS use for both SA and RS are negatively related to a self-reported history of engaging in SA and to endorsement of rape-supportive attitudes, a well-established correlate of SA (Murnen et al., 2002).

Items for the new SA PBS measure focus on active cognitive-behavioral approaches that could be implemented before or during sexual interactions (see Supportive Information Appendix A and Table 1). Most items address two proximal risk factors for SA in Abbey et al.'s (2011) extension of Malamuth et al.'s well-established

**TABLE 1** Reported use of sexual aggression protective strategies in last year

Item	Mean/SD	Never (%)	Seldom (%)	Sometimes (%)	Often (%)	Always (%)	N/A (%)
Explicitly ask a potential sexual partner for consent to engage in sexual behavior	3.73/1.40	11.0	11.6	15.0	18.6	43.8	16.2
Track your partner's changing emotional reactions throughout a sexual encounter (e.g., what is communicated through body language or facial expressions)	4.10/1.21	6.0	7.3	10.2	24.1	52.4	14.8
Focus on your partner's emotional responses rather than clothing style, physical attractiveness, and the setting when trying to figure out how sexually interested they feel	4.09/1.20	6.6	5.6	11.6	24.6	51.7	14.3
Watch for reduction in your partner's enthusiasm level throughout a sexual encounter (e.g., becoming quieter or withdrawn or asking to stop or slow down)	4.11/1.19	5.6	7.5	9.4	25.2	52.3	15.0
Back off and check in if your partner's enthusiasm decreases	3.96/1.17	4.3	9.6	15.8	26.1	44.1	17.1
Ask a new sexual partner for consent again when you increase the intimacy level during a sexual encounter (e.g., when move to oral, vaginal, or anal sex)	3.75/1.39	10.5	11.4	14.4	20.0	43.8	27.2
Avoid sexual behavior when your potential partner was too intoxicated to provide consent	4.18/1.22	6.6	5.1	12.0	15.9	60.4	27.3
Be aware that drinking can reduce your ability to understand your partner's emotions or sexual interest	4.09/1.22	5.9	7.1	13.9	18.3	54.8	22.2
Avoid confusing your emotions and sexual interest with your partner's emotions and sexual interest	3.98/1.18	5.8	7.1	14.5	28.3	44.3	17.8
Consider potential positive AND negative consequences of sexual behavior before you engage in it	3.88/1.20	5.5	9.6	16.8	27.5	40.7	15.3
Make sexual decisions based on your values and goals so you're less likely to regret your behavior later	3.86/1.21	5.5	9.3	20.2	24.0	41.1	15.7
Be aware that alcohol impairs your judgment and that of your partner, which can lead to behavior you or your partner later regret	4.06/1.19	5.1	7.5	14.6	21.5	51.2	19.8

Note: N/A (not-applicable) responses were excluded when computing descriptive statistics and non-N/A response percentages.

model of SA (Malamuth et al., 1991, 1995; Malamuth & Hald, 2017): misperceived sexual interest and alcohol consumption.

An extensive literature shows that college men at greater risk of exhibiting SA report more frequent misperceptions of women's sexual interest than their peers (see Abbey et al., 2011; Tharp et al., 2012, for reviews). Moreover, high-risk men show at least two key deficits in their processing of women's sexual interest cues that have proven to be malleable in cognitive training studies (Treat et al., 2017; Treat, Viken, et al., 2016). In particular, when judging how sexually interested a photographed woman feels, high-risk men focus less than their peers on women's affective cues and more on women's non-affective cues (e.g., Treat et al., 2017; Treat, Hinkel, et al., 2016; Treat, Viken, et al., 2016). It is easy to imagine how such processing patterns early in an interaction might increase risk for SA, perhaps via decreased sensitivity to later nonconsent cues or dismissal of such cues as token resistance (Farris et al., 2008; Treat, Viken, et al., 2016). Thus, five items on the new SA PBS assess behaviors that are intended to address these two deficits (e.g., tracking a partner's changing emotional reactions during a sexual encounter).

Recent reviews indicate that SA and heavy drinking frequently co-occur: approximately half of sexually aggressive episodes are associated with alcohol consumption by the perpetrator, victim, or both; men who drink heavily and in sexual situations are more likely to engage in SA; and campuses with higher heavy drinking rates show higher SA rates (Abbey et al., 2011, 2014; Crane et al., 2016; Tharp et al., 2012). Prospective studies show mixed findings for heavy drinking as a predictor of SA, once prior SA history is included as a predictor, but experimental studies clearly indicate that intoxication increases behavior consistent with SA, including increased misperceptions of women's sexual interest. Recent empirical work indicates that heavy drinking may also increase the likelihood of SA indirectly, via greater exposure to alcohol-related contexts (e.g., bars, parties; Testa & Cleveland, 2017; Cleveland et al., 2019). Thus, two items on the SA PBS measure target alcohol-related SA.

Three of the remaining five items focus on consent-related issues. Consent-related beliefs and perceptions predict SA perpetration, both cross-sectionally and prospectively (Warren et al., 2015; Zinzow & Thompson, 2019). Additionally, seeking explicit consent would be expected to decrease the likelihood that sexual misperception leads to SA. The final two items relate to internal motives for sexual behavior based on motivational interviewing (e.g., considering the pros and cons of engaging in sexual behavior; Miller & Rollnick, 2013).

We developed a measure of RS PBS as well because impersonal sexual behavior is a third well-established proximal risk factor for SA (Abbey et al., 2011; Malamuth et al., 1991, 1995, 2017; Tharp et al., 2012). In a recent review, Davis et al. (2018) showed that several sexual-risk behaviors were reliably associated with SA (e.g., number of past sexual partners, resistance to condom use). Lewis et al. (2009b) developed a measure that focused exclusively on PBS for condom use, but we aimed to develop a measure that focused on protective behaviors for a broader range of RS behaviors. The 11-item RS PBS scale (see Supporting Information Appendix B and Table 2) included three items

focused on using protection against pregnancy and sexually transmitted infections, as well as carrying a condom even if not expecting to have sex. Three other items targeted the risky co-occurrence of alcohol consumption and sexual behavior. The remaining five items targeted other aspects of RS, including avoiding sex when a partner's sexual history was unknown and in situations where sexual behavior might be regretted.

The current work allows us to address four interrelated goals. First, we aimed to characterize both average PBS use and individual differences in PBS use among college men with respect to SA and RS. Second, we evaluated whether men at greater risk of exhibiting SA—as indicated either by greater endorsement of rape-supportive attitudes or by reported engagement in SA in the past year—would rely less on SA PBS than their peers. Third, we aimed to determine whether men who have exhibited RS in the past year or who endorsed a greater preference for impersonal sex (i.e., positive sociosexual attitudes) would report using RS PBS less than their peers. Fourth, we evaluated whether SA PBS (or RS PBS) reliably predicted SA (or RS) even when other established predictors were included.

## 1 | METHODS

### 1.1 | Participants

Participants were 567 out of 804 undergraduates who identified as male at two universities and who received partial course credit for completing an online study. Participants in the final sample of 567 met four criteria: (1) they completed the survey (94.90% of larger sample); (2) they were 18–24 years old (97.01% of larger sample); (3) they reported being sexually attracted to women (95.65% of larger sample); and (4) they reported lifetime sexual contact with a woman (78.36% of larger sample). The average age of participants in the final sample was 19.17 years ( $SD = 1.29$ ). Regarding racial identity, 76.47% identified as Caucasian, 9.80% as Asian, 4.28% as Multiracial, 3.03% as African American, and 5.35% as other. Roughly 15% of the sample (14.70%) identified as Hispanic. Approval for the current project was obtained from the Institutional Review Boards of Arizona State University and the University of Iowa.

### 1.2 | Measures

#### 1.2.1 | Demographics

Participants reported demographic characteristics (i.e., age, race, ethnicity), whether they were sexually attracted to women, and whether they had ever had consensual intercourse with a woman.

#### 1.2.2 | Alcohol consumption questions

Participants reported the number of days they consumed alcohol in a typical week, how many drinks they had on a typical drinking day,

**TABLE 2** Reported use of risky sex protective strategies in last year

Item	Mean/SD	Never (%)	Seldom (%)	Sometimes (%)	Often (%)	Always (%)	N/A (%)
I carried a condom with me even if I was not expecting to have sex	2.69/1.37	26.2	21.9	21.4	17.3	13.2	14.5
I had no more than one partner during the same period of time with whom I had regular sexual contact	3.55/1.60	18.7	12.6	10.2	11.7	46.7	18.7
I avoided having sex in situations where I might later regret my behavior	3.47/1.35	12.8	11.5	19.2	28.5	27.9	19.8
I avoided having sex with someone I just met that day	3.32/1.48	15.9	18.6	16.1	16.6	32.9	22.9
I only had sex if I knew my potential partner's sexual history	3.22/1.46	15.7	22.1	15.5	18.1	28.5	20.1
I avoided having sex with high risk partners (e.g., injection drug user, known sexually transmitted infection, many prior sexual partners, etc.)	4.18/1.29	7.7	7.5	6.6	15.7	62.4	22.4
I used protection against pregnancy (e.g., condom, birth control pill)	3.94/1.25	6.6	9.6	12.7	25.5	45.6	16.8
I used protection against sexually transmitted infections (e.g., condom, dental dam)	3.63/1.34	10.2	12.7	16.2	25.9	35.0	18.2
I avoided drinking alcohol in situations where I knew sex was likely to occur	2.84/1.33	18.1	26.9	24.3	14.6	16.2	23.8
I controlled my alcohol consumption in situations where I knew sex was likely to occur	3.43/1.27	7.3	19.8	21.5	25.2	26.2	25.2
I avoided engaging in sexual behavior if I was too intoxicated to make good decisions	3.42/1.39	11.6	18.2	18.5	20.1	31.5	25.6

Note: N/A (not-applicable) responses were excluded when computing descriptive statistics and non-N/A response percentages.

and how many times in a typical month they consumed five or more drinks in a single day. These items are comparable to the three alcohol-use items on the Alcohol Use Disorders Identification Test (Bush et al., 1998). The base-10 log of the average standardized response to the three questions (plus 1.50 to avoid division by zero) was used in further analysis, given its right skew ( $\alpha = .830$  in the current sample).

### 1.2.3 | Illinois rape myth acceptance—short form (IRMA-SF)

The IRMA-SF is a 17-item questionnaire (plus three filler items) that assesses endorsement of rape-supportive attitudes (e.g., many women secretly desire to be raped, rape happens when a man's sex drive gets out of control) with good evidence of reliability and validity (Payne et al., 1999). Participants responded on a 7-point Likert scale anchored by not at all agree (1) and very much agree (7). The average response was used as a summary score ( $\alpha = .896$ ).

### 1.2.4 | Sociosexual attitudes (SS-A)

SS-A were assessed with 15 items from Bailey et al. (2000). All items were scored on a 5-point Likert scale ranging from “strongly agree”

to “strongly disagree.” Sample items include “It is better not to have sexual relations until you are married” and “Sex without love is ok.” The average response was used as a summary score ( $\alpha = .830$ ).

### 1.2.5 | Sociosexual behaviors(SS-B)

SS-B were assessed using four items about the frequency of specific unrestricted sexual behaviors (e.g., number of lifetime sexual partners, number of partners on one and only one occasion) Bailey et al., 2000. All items were scored on a 7-point frequency scale (e.g., 1 = none, 2 = 1–2, 3 = 3–5, 7 = 20, or more). The average response was base-10 log-transformed to reduce right skew ( $\alpha = .710$ ).

### 1.2.6 | Sexual experiences survey-short form perpetration-abbreviated (SES-SFP-A)

The SES-SFP-A is a 15-item self-report measure of sexual coercion and aggression (see Koss et al., 2007). Participants indicated the number of times (0, 1, 2, 3, or more) they engaged in each of three behaviors without consent over the past year using each of five tactics. The three behaviors were unwanted touching; having oral, vaginal, or anal sex; and attempting to have oral, vaginal, or anal sex. Note that SES-SFP (Koss et al., 2007) asks separately about oral,

vaginal, and anal sex, but most researchers in practice collapse across responses to these categories, given their low endorsement rates. Thus, we collapsed across these categories from the outset to decrease the length of the scale and survey. The five tactics were verbal pressure; showing displeasure; taking advantage when someone was drunk or “out of it”; threatening physical harm; and using force. Participants then were asked the sex of the person or persons to whom any acts were directed. We scored the SES-SFP-A dichotomously, separating the sample into men who responded negatively to all items (noncoercive; 93.3%;  $n = 528$ ) and men who responded positively to one or more items (sexually coercive or aggressive; 6.7%;  $n = 38$ ). One of the men classified as sexually coercive or aggressive indicated that he directed his behavior toward men only. This participant was dropped from the SES analyses given our focus on male-initiated SA toward women, but he was retained in all other analyses.

### 1.2.7 | Risky sexual behavior scale (RSBS; items drafted by authors)

Participants reported how often they engaged in eight risky sexual behaviors over the last year: had sex without protection against pregnancy or sexually transmitted infections (two items); failed to use protection because not carrying a condom; had sex with someone just met that day; had sex with a new partner without discussing partner's sexual history; had sex with high-risk partner; had sex with someone and later regretted it; and had ongoing sexual relationships with more than one person. Response options were never, 1–2, 3–5, 6–9, 10–14, 15–19, and 20 or more. Responses were scored on a scale from 1 (never) to 7 (20 or more). Nearly three-fourths (70.7%) of participants reported engaging in at least one RS act over the past year, and the average score was 1.67 ( $SD = .79$ ). Internal consistency reliability was adequate ( $\alpha = .774$ ).

### 1.2.8 | Protective behavioral strategies for risky sex (PBS-RS)

Participants reported how frequently they engaged in 11 RS PBS in the last year (see Supporting Information Appendix B). Six response options were provided: not applicable (N/A), never, seldom, sometimes, often, and always. Including the N/A response allowed participants to indicate that the question was not relevant to them (e.g., they hadn't consumed alcohol in the last year), while still providing an index of average PBS usage for items relevant to that participant. Sample items included “I used protection against pregnancy (e.g., condom, birth control pill),” “I controlled my alcohol consumption in situations where I knew sex was likely to occur,” “I only had sex if I knew my potential partner's sexual history,” and “I had no more than one partner during the same period of time with whom I had regular sexual contact.” Scoring procedures are reported in the results section ( $\alpha = .850$ ).

### 1.2.9 | Protective behavioral strategies for sexual aggression (PBS-SA)

Participants reported how frequently they engaged in 11 SA PBS in the last year (see Supporting Information Appendix A). Six response options again were provided. Sample items included “explicitly ask a potential sexual partner for consent to engage in sexual behavior,” “back off and check in if your partner's enthusiasm decreases,” “make sexual decisions based on your values and goals so you're less likely to regret your behavior later,” and “be aware that drinking can reduce your ability to understand your partner's emotions or sexual interest.” Scoring procedures are reported in the results section ( $\alpha = .957$ ).

## 1.3 | Procedure

Undergraduate men selected the online study for partial credit in their introductory psychology course. They read a consent letter online and consented to participate by continuing. They completed a battery of questionnaires related to sexual behavior and alcohol consumption, which took no more than 60 min. Only a subset of the completed questionnaires was relevant to the current study. In order, participants completed demographics, alcohol questions, the IRMA-SF, SS-A and SS-B, the SES-SF-A, the RSBS, the PBS-RS, and the PBS-SA. Participants then read a debriefing statement describing the primary goals of the study and viewed a list of local resources for addressing problems associated with sexual and drinking behavior.

## 1.4 | Data analytic plan

First, we described the overall sample, as well as the site-specific samples. Variables with significantly skewed distributions were log-transformed. Second, we conducted exploratory factor analyses (EFAs) within Mplus (Muthén & Muthén, 1998-2017) to evaluate whether our a priori two-factor solution was consistent with the data. Models ranging from one to five factors were estimated using a robust estimator (MLR) and an oblique rotation (geomin). Full Information Maximum Likelihood (FIML) estimation was used to estimate missing data. Recall that participants had the option of responding N/A to any item on the PBS measures that did not apply to them (e.g., they had not had sexual contact in the last year, they had not had intercourse in the last year, they had not been intoxicated in the last year, etc.). For instance, the 32 men (10.8%) who reported never having had consensual intercourse with a woman, but may have engaged in sexual behavior other than intercourse, provided a substantially higher frequency of N/A responses than their peers on the PBS-SA ( $M_s = 6.34, 1.77$ ),  $t(295) = -6.802, p < .001, d = 1.07$ , and the PBS-RS ( $M_s = 6.13, 1.85$ ),  $t(295) = -7.034, p < .001, d = 1.11$ . Because N/A responses indicate an inability to obtain an observation for an item because the situation did not apply to the participant, we treated N/A responses as missing and estimated them using FIML; this approach allowed us to retain all available data

in latent-structure analyses. The 14 participants who provided N/A responses to all items were deleted listwise from all subsequent PBS analyses, making the final sample size 283, rather than 297.

Third, we used confirmatory factor analytic (CFA) procedures within Mplus to evaluate the fit of a two-factor model that assumed a hypothesized simple structure in which all RS items (minus the first item) loaded on an RS factor, all SA items loaded on an SA factor, the factors were allowed to correlate, no cross-loadings were specified, and all residuals were uncorrelated. We anticipated that we might then consider data-driven modifications to the model structure (e.g., allowing cross loadings or residual correlations). Sixteen participants provided N/A responses to all items after excluding the first RS item, so the final sample size was 281.

Fourth, we computed regression-based factor scores for the final model. We also created simple average scores for the items receiving non-N/A responses on the two subscales, which provided an index of average PBS use for items relevant to each participant. The summary score for PBS-SA was based on responses to at least 5 of 12 items for 95.6% of sample, and the summary score for PBS-RS was based on responses to at least 5 of 11 items for 91.5% of the sample.

Fifth, the final model developed on the ASU sample was fit to the Iowa sample to determine whether the final CFA model cross-validated to a new sample.

Sixth, data from the ASU and Iowa samples were pooled for all subsequent analyses, given the cross-validation of the factor structure developed on the ASU sample within the Iowa sample. T-tests were used to compare PBS use among those who did and did not report SA or RS in the last year. Bivariate correlations were used to evaluate the magnitude of the association of the PBS measures with rape-

supportive attitudes (IRMA), SS-A, SS-B, and alcohol consumption. Finally, two multiple logistic regressions were conducted to determine whether PBS-SA (or PBS-RS) still reliably predicted SA (or RS) when other established correlates of SA and RS were included in the models (i.e., IRMA, SS-A, SS-B, and alcohol consumption).

## 2 | RESULTS

### 2.1 | Sample description

Table 3 describes the pooled and site-specific samples. On average, the pooled sample endorsed minimal rape-supportive attitudes, endorsed moderate levels of unrestricted SS-A, and reported engaging in unrestricted sexual behavior with 3–5 persons in the last year. Participants reported consuming alcohol a little more than once in a typical week, consuming almost four drinks on a typical drinking day, and binge drinking almost three days in a typical month. Sexually coercive or aggressive behavior at least once in the last year was reported by 6.71% of the sample, and at least one risky sexual behavior in the past year was reported by 70.65% of the sample. Missing data were rare for these measures and never exceeded 1% of the sample.

### 2.2 | Protective behavior strategy scale development on ASU sample

In our initial EFA, the scree plot showed a clear elbow at three factors, indicating a two-factor structure was ideal. The two-factor

**TABLE 3** Sample characteristics

Sample characteristic	ASU sample	Iowa sample	Pooled sample
Final N for study	297	270	567
Age	19.21 (SD = 1.39)	19.12 (SD = 1.17)	19.17 (SD = 1.29)
Race and ethnicity			
Caucasian	68.00%	85.80%	76.57%
Asian	13.30%	6.00%	9.80%
Multiracial	5.40%	3.00%	4.28%
African American	3.40%	2.60%	3.03%
Hispanic	19.70%	9.30%	14.70%
Rape-supportive attitudes	2.03 (SD = 0.78)	1.80 (SD = 0.72)	1.92 (SD = 0.76)
Sociosexual attitudes	3.05 (SD = 0.63)	2.90 (SD = 0.59)	2.98 (SD = 0.62)
Sociosexual behaviors	2.71 (SD = 0.98)	3.25 (SD = 0.81)	2.97 (SD = 0.94)
Drinking days per week	1.08 (SD = 1.13)	1.36 (SD = 1.15)	1.21 (SD = 1.15)
Typical consumed drinks	3.29 (SD = 2.92)	4.26 (SD = 2.90)	3.75 (SD = 2.95)
Binge drinking days per month	2.35 (SD = 3.24)	3.25 (SD = 3.55)	2.78 (SD = 3.42)
% Engaging in SA in last year	7.77%	5.56%	6.71%
% Engaging in RS in last year	70.27%	71.09%	70.65%

Abbreviations: RS, risky sex; SA, sexual aggression.

structure also was the most interpretable, with the two factors mapping onto RS and SA protective strategies, respectively. A total of 10 of the 11 RS items loaded reliably onto the first factor with all standardized loadings exceeding 0.42. The first item, "I carried a condom with me even if I was not expecting to have sex," showed a minimal loading in the wrong direction on the first factor, with a standardized loading of  $-0.091$ ,  $z = -0.990$ . Thus, we dropped this item in subsequent analyses. All 12 SA items loaded reliably onto the second factor with all standardized loadings exceeding 0.55. Reliable cross-loadings occurred for 7 of the 22 retained items, with an average standardized loading of 0.31, although the loadings were always greater on the primary factor. The two factors were significantly positively correlated,  $r = .416$ .

The fit of an initial CFA model with the two factors identified in the EFA was inadequate: RMSEA = 0.098, CFI = 0.811, TLI = 0.790, and SRMR = 0.075. Modification indices indicated parameters that could be freed to improve model fit. We iteratively freed a single parameter with the largest modification index in a series of subsequent models, until no remaining modification indices exceeded 10. Large modification indices emerged only for correlated residuals, rather than cross-loadings, consistent with a simple structure for the measures and the strong interrelatedness of some item subsets.

The final CFA factor structure retained 10 correlated residuals within one of the two factors. The pattern of correlated residuals was largely theoretically consistent. For example, correlated residuals were estimated among three SA items focused on emotion tracking, between two SA items focused on consent, among three alcohol-related RS items, and between two RS items about condom use. The fit of the final model was adequate: RMSEA = 0.050, CFI = 0.953, TLI = 0.945, and SRMR = 0.054. All 10 RS items loaded reliably onto the RS factor with standardized loadings greater than 0.44. All 12 SA items loaded reliably onto the SA factor with standardized loadings greater than 0.59. The factors showed a significant positive association,  $r = .683$ ,  $z = 11.517$ ,  $p < .001$ .

Regression-based factor scores and simple average scores correlated very strongly for the RS scale,  $r = .92$ , and the SA scale,  $r = .95$ . Thus, we used average responses in all subsequent analyses.

## 2.3 | Cross-validation of factor structure on iowa sample

When the final CFA model developed on the ASU sample was fit to the Iowa sample, fit remained acceptable: RMSEA = 0.055, CFI = 0.942, TLI = 0.933, and SRMR = .051. All items loaded reliably onto their respective factors, and the factors correlated strongly,  $r = .61$ .

## 2.4 | Protective behavior strategy results

Table 1 presents descriptive statistics for items on the measure assessing PBS use for sexually aggressive behavior (PBS-SA) for the full pooled sample. Participants reported that their average use of SA protective strategies in the last year was more than "sometimes" and nearing "often" ( $M = 3.95$ ,  $SD = 1.06$ , on a 5-point scale). Marked individual differences were present. On average, 48.4% of participants indicated they "always" used the protective strategies, and 71.3% indicated that they "always" or "often" used the protective strategies. In contrast, 14.8% indicated that they "never" or "seldom" used the strategies.

Table 2 presents descriptive statistics for items on the measure assessing protective behavioral strategy use for risky sexual behavior (PBS-RS). Participants reported that their average use of RS protective strategies in the last year (after dropping the first item) was roughly equally between "sometimes" and "often" ( $M = 3.52$ ;  $SD = 1.00$ ). Here too, substantial variability in responding emerged. On average, 35.3% indicated they "always" used the protective strategies, and 55.5% indicated that they "always" or "often" used the protective strategies. In contrast, 28.5% indicated that they "never" or "seldom" used the strategies. SA and RS PBS use correlated strongly,  $r(488) = .512$ ,  $p < .001$ .

Table 4 presents descriptive and inferential statistics for the comparison of PBS use among those who did and did not report SA or RS in the last year. Men who reported engaging in SA toward women reported substantially lower use of SA PBS in the last year, relative to their peers,  $d = -1.09$ , as well as moderately to markedly

**TABLE 4** Comparing protective strategy use among those who did and did not report sexually coercive or aggressive behavior, and risky sexual behavior in the last year

Sexual behavior classification	PBS-SA		PBS-RS	
	Mean/SD/N	Statistics	Mean/SD/N	Statistics
Sexual coercion/aggression (SES-SFP-A)				
Reported engagement	2.91/1.11/36	$t(503) = -6.285$ ,	2.89/0.97/35	$t(507) = -4.012$ ,
Did not report engagement	4.03/1.02/469	$p < .001$ , $d = -1.09$	3.58/0.98/474	$p < .001$ , $d = -0.70$
Risky sexual behavior (RSBS)				
Reported engagement	3.96/1.01/373	$t(489) = 0.259$ ,	3.36/0.94/380	$t(495) = -7.381$ ,
Did not report engagement	3.93/1.19/118	ns, $d = 0.03$	4.09/0.95/117	$p < .001$ , $d = -0.78$

Abbreviations: PBS, protective behavioral strategies; RS, risky sex; RSBS, risky sexual behavior scale; SA, sexual aggression; SES-SFP-A, Sexual Experiences Survey, short-form for perpetration, abbreviated.

**TABLE 5** Correlations of protective behavioral strategy use with continuous variables

Measure	PBS-SA	PBS-RS
Rape-supportive attitudes	$r(503) = -.345, p < .001$	$r(508) = -.192, p < .001$
Sociosexual attitudes	$r(491) = -.168, p < .001$	$r(497) = -.413, p < .001$
Sociosexual behaviors	$r(503) = -.018, ns$	$r(508) = -.202, p < .001$
Alcohol consumption	$r(503) = .004, ns$	$r(508) = -.212, p < .001$

Abbreviations: PBS, protective behavioral strategies; RS, risky sex; SA, sexual aggression.

lower use of RS PBS,  $d = -.70$ . In contrast, those who reported engaging in RS in the last year did not report differing use of SA PBS relative to their peers,  $d = .03$ , but they did report using RS PBS far less often,  $d = -.78$ . Item-specific findings contrasting those who did and did not endorse SA in the last year are presented in Tables S7 and S8. Item-specific findings for SA PBS items (see Table S7) show moderate-to-very-strong reliable group differences for all 12 items, with particularly large differences for two of the three alcohol-related items ( $ds = -1.17, -1.29$ ): avoiding sex when partner too intoxicated to consent, and being aware that drinking can reduce ability to track a partner's emotions. In contrast, only 7 of the 10 final RS PBS items differentiated reliably among those who did and did not report a history of SA (see Table S8): having no more than one partner at a time, avoiding having sex where behavior might be regretted, avoiding sex with someone met that day, only having sex if knew potential partner's sexual history, avoiding sex with high-risk partners, using protection against pregnancy, and avoiding sex when too intoxicated to make good decisions.

Table 5 presents the associations of PBS measures with rape-supportive attitudes (IRMA), SS-A, SS-B, and alcohol consumption. IRMA showed a moderately negative association with SA PBS,  $r = -.345$ , and a weaker association with RS PBS,  $r = -.192$ . SS-A was

weakly negatively correlated with SA PBS,  $r = -.168$ , but moderately to strongly correlated with RS PBS,  $r = -.413$ . SS-B was moderately negatively correlated with RS PBS,  $r = -.202$ , but was unrelated to SA PBS. The alcohol use measure correlated weakly with RS PBS,  $r = -.212$ , but was unrelated to SA PBS.

Table 6 presents the results of two multiple logistic regression analyses that predict SA and RS. IRMA ( $b = .657$ ;  $SE = .211$ ;  $p < .01$ ; odds ratio [OR] = 1.645) and SS-B ( $b = 3.803$ ;  $SE = 1.526$ ;  $p < .05$ ; OR = 1.691) both predicted an increased odds of SA. PBS-SA predicted a reduced odds of SA ( $b = -.651$ ;  $SE = .163$ ;  $p < .001$ ; OR = 0.501), indicating that a one-SD increase in PBS-SA was associated with a 49.9% reduced likelihood of SA. SS-A ( $b = 0.405$ ;  $SE = .197$ ;  $p < .05$ ; OR = 1.283), SS-B ( $b = 1.941$ ;  $SE = .820$ ;  $p < .05$ ; OR = 1.307), and alcohol consumption ( $b = 1.431$ ;  $SE = .436$ ;  $p < .01$ ; OR = 1.484) predicted an increased odds of RS. PBS-RS predicted a reduced odds of RS ( $b = -.630$ ;  $SE = .175$ ;  $p < .001$ ; OR = .534), such that a one-SD increase in PBS-RS was associated with a 46.6% reduced likelihood of RS. Overall, both PBS measures emerged as the best predictors of either SA or RS, even when other well-established predictors of SA and RS were included in the model, and each one-SD decrease in PBS use on either scale was associated with approximately a twofold increase in the likelihood of either SA or RS.

**TABLE 6** Multiple logistic regression results for prediction of past-year engagement in sexual aggression and risky sex

	Estimate	SE	Z score	p Value	Odds ratio
Sexual aggression					
PBS for sexual aggression	-0.651	0.163	-4.007	0.000	.501
Rape-supportive attitudes	0.657	0.211	3.115	0.002	1.645
Sociosexual attitudes	0.373	0.257	1.456	0.145	1.254
Sociosexual behaviors	3.803	1.526	2.491	0.013	1.691
Alcohol consumption	0.419	0.730	0.574	0.566	1.122
Risky sex					
PBS for risky sex	-0.630	0.175	-3.608	0.000	.534
Rape-supportive attitudes	-0.123	0.140	-0.878	0.380	.911
Sociosexual attitudes	0.405	0.197	2.054	0.040	1.283
Sociosexual behaviors	1.941	0.820	2.366	0.018	1.307
Alcohol consumption	1.431	0.436	3.280	0.001	1.484

Note: Odds ratios were computed after standardizing predictors to facilitate interpretation and comparison across predictors.

Abbreviation: PBS, protective behavioral strategies.

### 3 | DISCUSSION

The current study developed new measures of PBS for SA and RS. After cross-validating the two-factor structure of the new measures on an independent sample from another university, we used the data from over 500 college men to characterize their PBS use and to evaluate whether those who reported engaging in SA and RS in the last year showed lower PBS use than their peers. We address our first research goal by presenting and discussing men's PBS use in the SA and RS domains. Next, we address our second and third research goals by characterizing and commenting on the behavioral and attitudinal correlates of PBS use, including self-reported histories of SA and RS. Then, we consider study limitations and future directions related to further development and evaluation of the PBS measures. Finally, we consider potential implications of the current work.

#### 3.1 | Research findings

##### 3.1.1 | PBS use among college men

On average, this large sample of over 500 sexually active college men from two large state universities who endorsed sexual attraction to women reported that they fairly often—but not always—used PBS for SA. Thus, as a set, these items reference cognitive-behavioral approaches that a large percentage of undergraduate men use on a regular basis. Pending further research establishing their prospective incremental predictive validity, these PBS items could prove to be acceptable prevention targets for this population. The five items addressing affective-processing deficits and potential misperceptions of sexual interest, as well as the two items addressing alcohol effects on sexual perception and decision making, were endorsed most strongly. Average endorsement of the two motivational-interviewing strategies of considering pros and cons, as well as one's values and goals, was at a similar level, though there clearly is room to increase the frequency with which all of these strategies are employed. Two of the three consent-related items that focused on obtaining initial and ongoing consent were endorsed at a lower average level. However, the final consent-related item focused on avoiding sexual activity with an intoxicated partner was endorsed more strongly. Thus, although the average college male participant may have accepted that intoxicated persons cannot provide consent, he did not routinely seek explicit consent for sexual activity. This finding echoes concerns raised in the literature about the potential unacceptability of seeking explicit consent among undergraduate men and a preference to rely instead on riskier nonverbal indicators (see Muehlenhard, et al., 2016, for a review). Importantly, marked individual differences in average SA PBS use were also observed, with almost half of the sample indicating that they “always” used the SA PBS, but almost 15% indicating that they “never” or “seldom” used them.

On average, college men reported sometimes-to-often using the RS PBS, and rates of use were less frequent than for SA PBS. Respondents most strongly endorsed avoiding sex with high-risk

partners, using protection against pregnancy and sexually transmitted infections, and having only one partner at a time. A third protection-related item— carrying a condom even if not expecting sex—performed poorly in the latent structure analyses and was eliminated from subsequent analyses. Avoidance of alcohol consumption when anticipating sexual activity was the least frequently used strategy, but controlling alcohol consumption was used somewhat more frequently, suggesting that a harm-reduction approach may have greater appeal than an abstinence strategy for college students. The remaining strategies were endorsed relatively infrequently, particularly only having sex if the partner's sexual history is known and not having sex with someone met that day. Marked individual differences in PBS use again emerged, in this case with almost a third of the sample reporting that they “never” or “seldom” used the RS strategies. Overall, these findings for a broad range of PBS for RS are concerning and extend the work of Lewis, Logan, et al. (2009), who documented that college men endorsed using six condom-related PBS items at low rates.

SA PBS and RS PBS use correlated strongly, as expected, given the interrelated nature of RS and SA both theoretically and empirically (Abbey et al., 2011; Davis et al., 2018; Malamuth et al., 1991, 1995, 2017). In the current study, participants who reported engaging in at least one sexually coercive or aggressive behavior in the last year also reported more frequent engagement in risky sexual behavior,  $t(550) = 10.829$ ,  $p < .001$ ,  $d = 1.84$ .

##### 3.1.2 | Correlates of PBS use

Men who reported engaging in SA in the last year ( $n = 36$ ) reported sharply lower reliance on SA PBS,  $d = -1.09$ , and RS PBS,  $d = -.70$ , in comparison to their peers. Endorsement of rape-supportive attitudes also showed a moderate negative association with SA PBS, and a weaker negative association with RS PBS. These findings are consistent with expanded versions of Malamuth et al.'s model of SA (1991, 1995, 2017; Abbey et al., 2011), which implicate misperceived sexual interest, heavy alcohol consumption, and impersonal sexual behavior as proximal risk factors for SA. The findings also extend our understanding of the role that these proximal factors may play in SA: they indicate that high-risk men not only misperceive sexual interest, drink heavily, and engage in impersonal sex, but also less frequently take steps that may reduce the risks associated with these behaviors.

The much larger group of men who reported engaging in at least one risky sexual behavior in the last year ( $n = 390$ ) reported using RS PBS moderately less often than the rest of the sample,  $d = -0.78$ , consistent with expectations. Additionally, RS PBS use showed small-to-moderate negative associations with both SS-A and SS-B, as well as alcohol consumption. These three continuous measures correlated more weakly (if at all) with SA PBS use. Several RS strategies essentially entail not engaging in RS behaviors, raising questions about criterion contamination accounting for part of the association of RS PBS use with RS. Thus, it is encouraging to see that RS PBS use also showed the expected relationship with SS-A, and that this

association was much stronger than for SA PBS use. Although RS PBS were expected to be less strongly related to engagement in SA relative to RS, the fact that they were completely unrelated,  $d = 0.03$ , was surprising given strong correlations between RS and SA. This asymmetry, however, reflects in part the substantially greater endorsement of RS (70.7% of the sample) than SA (6.7% of the sample). When those reporting an average RS score of 3.21 or more (7.1%) are contrasted with the rest of the sample, the expected differences emerge: those reporting more RS, relative to their peers, report a nonsignificant tendency toward using fewer PSB for SA, as well as a reliable tendency toward using fewer PBS for RS. Thus, the asymmetry in the correlates for SA PBS and RS PBS use may reflect differences in the endorsement rates for SA and RS.

Overall, the new PBS measures show the expected pattern of convergent and divergent associations with relevant behavioral and attitudinal variables, including RS and SA, rape-supportive attitudes, SS-A and SS-B, and alcohol use. Moreover, multiple logistic regression analyses showed that PBS use reliably predicted reduced odds of SA and RS, even when rape-supportive attitudes, alcohol consumption, and SS-A and SS-B were included as simultaneous predictors. A 1-SD reduction in PBS use was associated with approximately a twofold increase in the likelihood of either SA or RS, even in this multivariate context. This suggests the potential incremental utility of PBS measures within the SA and RS domains, albeit only cross-sectionally.

### 3.2 | Limitations and future directions

The current study introduces two new PBS measures for SA and RS and further documents their use and correlates in a large sample of sexually active college men. Future work profitably can focus on the areas outlined below, in part to address limitations of the current work.

First, screening items could be developed to reduce the number of N/A responses to the PBS measures. For example, respondents might complete the measures only if they first endorsed having had any sexual contact with a woman in the past year. Second, additional instructions could better place participants in the relevant context by indicating that they should assume that they were engaging in sex or considering engaging in sex when responding to the items. Third, it is unclear whether the PBS for SA and RS are used explicitly with the goal of reducing risk, and more research is needed to determine whether such intent is present. Fourth, the generalizability of the current findings to other populations needs to be evaluated, both by administering the measures to more diverse populations and by evaluating measurement-invariance across key dimensions of population variability. For example, it is important to determine if these measures prove appropriate for female respondents and for those in same-sex relationships.

Moreover, a variety of interesting questions could be addressed with the PBS measures. For example, researchers could evaluate whether college men underestimate the typical college man's use of

SA and RS PBS, whether normative (mis)perception is associated with one's own use of PBS, and whether the magnitude of any misestimation is greater for those who report engaging in SA and RS. Similar work with heavy-drinking PBS use has demonstrated that college men underestimate the typical college man's use of drinking-related PBS, and that normative (mis)perceptions are associated with men's own PBS use (Benton et al., 2008; Lewis et al., 2009b). Within the RS domain, Lewis et al. (2014) showed that college men underestimated the frequency of condom and birth control use among same-sex peers, and that judgments of peers' use of birth control positively correlated with one's own use. Future research should also determine whether PBS use prospectively predicts SA and RS, after controlling for prior SA and RS, as well as an array of established prospective predictors of SA and RS. Studies examining the prospective prediction of alcohol consumption and problems from use of PBS for heavy drinking have shown mixed results (e.g., see Grazioli et al., 2015; Pearson, 2013). Gilmore et al. (2018), however, demonstrated that more frequent use of sexual-victimization PBS strategies predicted the severity of sexual assaults experienced over a subsequent 3-month period among a sample of heavy-drinking women. Although the current study demonstrates that PBS use cross-sectionally predicts engagement in SA and RS above and beyond several established predictors, prospective prediction would bolster confidence in the potential utility of addressing PBS use within prevention programs.

### 3.3 | Implications

Overall, these findings suggest the potential utility of investigating PBS for both SA and RS as components of sexual-assault prevention programming, as well as further considering how best to use motivational-interviewing techniques to enhance explicit consent-seeking for sexual activity. Incorporation of PBS for SA as well as RS into prevention programs for RS also might prove helpful, given Davis et al.'s (2018) recent suggestion that "rather than focusing exclusively on "what not to do," [sexual risk-taking] programming must also provide information on healthy sexual relationships and encourage open sexual communication" (p. 88). The co-occurrence of SA and RS underscores the potential utility of prevention programs that simultaneously target SA and RS (Davis et al., 2018).

As noted in the introduction, Reid and Carey (2015) recently concluded in their literature review that PBS use reliably mediated treatment effects on college student drinking when normative feedback on PBS use was provided, but not when only review of PBS strategies was provided. Thus, it will be important to move beyond simple review of PBS for SA and RS and provide personalized normative feedback on these PBS. Additionally, it may be necessary to incorporate cognitive skills training into SA prevention efforts to redress the affective-processing deficits that are implicated in SA and thereby targeted in a number of PBS for SA (e.g., track your partner's changing emotional reactions throughout a sexual encounter). Thus, future research should explore the utility of

integrating relevant cognitive-training experiences (education, practice, and feedback) with personalized normative feedback for SA PBS, in an effort both to redress relevant affective-processing deficits and to enhance motivation to use new cognitive skills.

## CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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### SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

**How to cite this article:** Treat TA, Corbin WR, Viken RJ. Protective Behavioral Strategies for Sexual Aggression and Risky Sexual Behavior. *Aggressive Behavior*. 2021;47:284–295. <https://doi.org/10.1002/ab.21949>