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ABSTRACT

Harmful alcohol use and sexually transmitted infections (STIs) are significant public health concerns for college students. Because alcohol use and condomless sex often co-occur in this population, alcohol-associated condomless sex has been identified as a target for behavioral interventions. Existing theoretical frameworks have not garnered sufficient empirical support to serve as the foundation for interventions. The primary goal of the current study was to use a mixed-methods approach to develop a novel model of college student alcohol-associated condomless sex that combines elements from well-established health behavior theories. In Aim 1, multilevel structural regression models were estimated to predict condomless vaginal intercourse in a sample of sexually-active college student drinkers ($N = 57$). An Exploratory Aim investigated the extent to which the model estimated in Aim 1 fit sexual activity occurring prior to the COVID-19 pandemic ($N = 128$). Aim 2 consisted of in-depth-interviews with a sub-sample of participants ($n = 18$) to gather perceptions about the role of alcohol in sexual activity and identify additional constructs pertaining to college student condom use. Quantitative results demonstrated the best-fitting model explained a significant proportion of variance in condomless vaginal intercourse at the between- and within-person level. Themes derived from the in-depth-interviews identified supplemental components of condom use decision-making. Findings from both aims were synthesized to construct a preliminary combined model of alcohol-associated condomless sex. This model can be refined in future work and ultimately serve as the theoretical foundation from which to develop a combination alcohol-STI prevention-intervention tailored to college students.

Development of a Combined Model of College Student Alcohol-Associated Condomless Sex

by

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M.S., Syracuse University, 2018

Dissertation

Submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in Clinical Psychology

Syracuse University

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Development of a Combined Model of College Student Alcohol-Associated Condomless Sex

Harmful alcohol use and sexually transmitted infections (STIs) are both significant public health concerns for college students. Sixty percent of college students report consuming alcohol during the previous 30-days (American College Health Association [ACHA], 2020) and approximately 20% meet criteria for alcohol use disorder (Blanco et al., 2008). Additionally, approximately 65% of college students are sexually active, yet only 3% report always using a condom during vaginal sex (ACHA, 2020). Inconsistent condom use contributes to the rising prevalence of STIs among college students—with recent estimates suggesting that 15-24-year-olds acquire nearly half of the 26 million annual STIs (CDC, 2021). The estimated annual STI treatment costs incurred by the United States healthcare system totals \$16 billion, 26% of which is accounted for by individuals aged 15–24 (Weinstock et al., 2021). Moreover, drinking and sexual activity frequently co-occur among college students (Brown et al., 2016; Hingson et al., 2005; Kaly et al., 2002; Lewis et al., 2009; Simons et al., 2018). Indeed, recent estimates suggest that as many as 12–23% of college students report engaging in condomless sex when consuming alcohol during the previous 12 months (ACHA, 2020, 2021). These trends indicate that there are still critical gaps in efforts to intervene on alcohol-associated condomless sex in college students.

The efficacy of existing alcohol-associated sexual risk interventions targeting college students is variable. A systematic review of interventions for college student alcohol-associated sexual risk found mixed evidence supporting the efficacy of the seven studies that met inclusion criteria (Kilwein et al., 2017). Of the four trials targeting condom use in both male and female students (Chernoff & Davison, 2005; Dal Cin et al., 2006; Dermen & Thomas, 2011; Patrick et al., 2014), only two demonstrated increased rates of condom use post-intervention (Dal Cin et

al., 2006; Dermen & Thomas, 2011). Further, neither of these trials assessed whether the sexual encounters during the follow-up period occurred in conjunction with alcohol consumption, and thus were unable to assess the efficacy of condom use promotion during alcohol-associated sexual events. This review highlights the need to further develop the evidence-base supporting behavioral interventions that address college student alcohol-associated condomless sex. In order to do so, research focused on the development of comprehensive theoretical models that explain college student alcohol-associated condomless sex would allow for the advancement of more effective behavioral interventions.

Theoretical Models Applied to Alcohol-Associated Condomless Sex

Theoretical models most often applied to alcohol-associated condomless sex can be categorized into three domains: (1) rational/cognitive health behavior, (2) affective/dual-systems decision-making, and (3) pharmacological effects of acute alcohol intoxication. Although each theory has longstanding empirical support, they have yielded limited results when applied to college students. Prior to proposing a theoretical conceptualization to address the aforementioned limitations, an overview of these three theoretical approaches is provided.

The Information-Motivation-Behavioral Skills (IMB; Fisher, 1997; Fisher & Fisher, 1992) model is a popular cognitive health-behavior theory with widespread support for promoting condom use in heterosexual adults (>age 21; Albarracín et al., 2005). The IMB posits that *information* about condom use (e.g., STI knowledge), *motivation* to engage in condom use, and the *behavioral-skills* to effectively use condoms (e.g., self-efficacy) are fundamental determinants of condom use behavior (Fisher, 1997; Fisher & Fisher, 1992). Although the IMB model functions as the basis of numerous condom use promotion interventions (Pedlow & Carey, 2003), it has explained only ~10% of the variance in college student condom use (Fisher et al.,

1994). One potential explanation for the IMB's shortcomings is that it assumes during sexual encounters college students make *rational* decisions regarding condom use, neglecting the role of affective processes in sexual decision-making (McKirnan et al., 1996), which is relevant to the distinct stage of development that is emerging adulthood and the unique socioenvironmental setting in which alcohol use and sexual activity occur for college students (Fielder et al., 2014).

In contrast, the dual-systems model of youth decision-making (Duell et al., 2016; Harden et al., 2017; Steinberg, 2008) recognizes that individuals act as both rational operators and *emotional* beings, asserting that two distinct neurobiological systems are involved in decision-making: an "automatic" socioemotional system that increases the desire to engage in reward-seeking behaviors, and a "slower" cognitive control system which uses deliberate, effortful processes to exert self-regulation. In the model's application to college students and their elevated rates of risky behavior, evidence suggests that the socioemotional system develops earlier in life than the cognitive-control system, and thus emerging adults (including college students) are more likely to rely on *reward-seeking* tendencies during decision-making and less on their ability to exert *self-regulation*. Despite evidence in support of the dual-systems model (Shulman et al., 2016), there have been few empirical tests of the model in the context of youth sexual behavior to date (Rendina, 2015). Additionally, the original model makes no predictions about alcohol's role in decision-making.

Alcohol myopia theory (Steele & Josephs, 1990) asserts that when an individual engages in sexual behavior while intoxicated, attention is narrowed to the salient situational cues of the encounter (e.g., sexual arousal) at the expense of distal consequences (e.g., STI-risk), thereby increasing the likelihood of engaging in condomless sex. Experimental studies with college students have demonstrated strong support for alcohol myopia theory (Scott-Sheldon et al.,

2016). Yet, event-level studies that assess the co-occurrence of alcohol consumption and sexual activity yield mixed-findings—higher than average alcohol consumption is associated with increased *and* decreased likelihood of engaging in condomless sex (Brown et al., 2016; Cooper, 2006; George, 2019; Kaly et al., 2002; Leigh, 2002; Lewis et al., 2009; Weinhardt & Carey, 2000). Only recently has alcohol myopia been examined in conjunction with dual-systems approaches (Simons et al., 2018), which for reasons stated above, may be advantageous for studies with college student samples. As such, additional event-level studies that can account for the multiple influences on condom use in the context of alcohol consumption among college students can clarify the mixed-findings in the literature.

The theories reviewed above largely exist in the literature as non-overlapping approaches to understanding event-level alcohol-associated sex, and are typically employed discretely (Rendina, 2015). Thus, it is plausible that the isolated application of these theoretical models may, in part, explain why they have limited predictive utility when applied to college students. Moreover, the unique weaknesses of the IMB, dual-systems, and alcohol myopia theories pertaining to college students can be remedied by the complementary strengths each possesses. For example, the dual-systems model recognizes the affective nature of sexual encounters, accounting for reports of condomless sex “just happening” in the “heat-of-the-moment” (George, 2019). This “automatic” process may be strengthened during sexual events characterized by alcohol intoxication (George, 2019). Indeed, evidence suggests that alcohol consumption may attenuate the influence of self-regulation tendencies fueled by the cognitive control system (Simons et al., 2018), while simultaneously decreasing the salience of distal cues for condom use (e.g., condom use information). Additionally, IMB constructs are fundamental to condom use, regardless of any alcohol intoxication consequences. For instance, without the behavioral skills

to use condoms, the act of condom use would be impossible whether or not acute alcohol intoxication was at play. Taken together, as evidenced by the empirical support for each theory in the literature, elements of the IMB (condom use information, condom use motivation, and condom use behavioral-skills), dual-systems (self-regulation and reward-seeking), and alcohol myopia (number of drinks consumed prior to a sexual event) models merit integration into an overarching framework that can maximize our ability to predict college student alcohol-associated condomless sex (Figure 1). What follows is a review of the literature on the college student alcohol-condomless sex relationship, which serves to provide initial evidence in support of the practical utility of a novel theoretical model that combines constructs from the aforementioned three theories.

Alcohol-Associated Condomless Sex in College Students

There is an extensive body of literature examining the association between alcohol use and condomless sexual activity in college students (Brown et al., 2016; Kaly et al., 2002; Kilwein et al., 2017). Findings from global association studies—studies that test the association between aggregate measures of alcohol consumption and sexual activity—show a positive association between aggregated measures of alcohol consumption quantity and frequency and increased sexual risk behavior (Brown et al., 2016). These findings are consistent with public perception that alcohol consumption invariably leads to condomless sex (Vélez-Blasini, 2008). Further, a meta-analysis synthesizing experimental research concluded that acute intoxication is a causal antecedent of risky sexual decision-making and proxies of condomless sex (e.g., condom use intentions; Scott-Sheldon et al., 2016). Event-level studies—fine-grained assessments of alcohol consumption during specific sexual encounters over a period of days or weeks (Weinhardt & Carey, 2000)—yield mixed-findings (Brown et al., 2016), even when

accounting for moderators such as sexual relationship characteristics (Brown et al., 2016). For example, one study of alcohol-associated sexual activity found binge drinking (i.e., > 4/5 standard drinks for women/men during one drinking event) to be associated with *increased* likelihood of condom use (Patrick, 2013). Conversely, in a 90-day multiple-event study, there was no main effect of any alcohol consumption on condom use, however, less condom use was associated with steady sex partners (Scott-Sheldon, Carey, & Carey, 2010). Additional event-level research is warranted to clarify these inconsistent findings, which may be attributable to: (1) overreliance on self-report instruments of risk behavior correlates, (2) unidimensional measurement of sexual relationship characteristics, and (3) erroneous assumptions about the linear effects of alcohol intoxication.

Overreliance on self-report instruments of risk behavior correlates. There is a lack of research that employs a combination of self-report and behavioral tasks to index latent constructs associated with condom use, even those informed by dual-systems models (e.g., Simons et al., 2018). The majority of research examining alcohol use and sexual activity in college students relies exclusively on self-reports of dual-systems model constructs associated with condom use behavior (e.g., impulsivity). Self-reports are valuable for assessing subjective perceptions; however, they may be particularly inaccurate when assessing personality constructs due to distorted self-perceptions (McDonald, 2008). Further, research has indicated that multiple measurement approaches (e.g., self-report questionnaires with laboratory-based behavioral tasks), enhance construct validity when indexing multifaceted latent constructs, such as those proposed by the dual-systems model (Harden et al., 2017; McDonald, 2008). Harden et al. (2017) developed a battery of measures to index dual-system model constructs and demonstrated that the use of self-reports with behavioral tasks as indicators of reward-seeking and self-regulation

provided the best-fitting factor structure for the dual-systems model. In order to address this gap in the literature, and enhance construct validity, this study used a multimethod assessment to measure dual-systems constructs related to alcohol-associated condomless sex.

Unidimensional measurement of sexual relationship characteristics. Sexual partner-type is a well-known moderator of the association between alcohol and condomless sex; however, variability in its measurement has produced mixed-findings (Cooper, 2010). Condom use with both casual and committed sex partners has been shown to be negatively *and* positively associated with alcohol use (Leigh, 2002; Brown et al., 2016). Partner-type has been defined by relationship duration (LaBrie et al., 2005; Simons et al., 2018), level of relationship commitment (Fehr et al., 2015), categorical titles (e.g., steady partner, first-time partner; Cooper & Orcutt, 2000; Walsh et al., 2014), and perceived seriousness of the relationship (Woolf-King & Maisto, 2015). A single indicator may be insufficient to capture the multidimensional nature of sexual relationship characteristics. For example, two individuals may engage in a “casual” sexual relationship for an extended duration (e.g., > 12-months), however, they both may not consider the relationship “serious” or “committed” (e.g., “friends with benefits”; Vanderdrift et al., 2012). Conversely, individuals engaging in a sexual relationship for a brief period can also foster a strong emotional bond and commit to a monogamous or “serious” relationship shortly after initiating sexual activity. Assessing both relationship duration *and* status is particularly relevant for condom use, due to research suggesting that condom use is less frequent with regular or monogamous partners (Gómez & Marín, 1996; Macaluso et al., 2000) and that condom use decreases over time (Civic, 2000; Hammer et al., 1996). In order to address this gap in the literature, both a subjective indicator of perceived relationship status, *and* an objective indicator of relationship duration, was used to better understand how this important moderator functions in

the context of alcohol-associated sexual activity among college students.

Erroneous assumptions about the linear effects of alcohol intoxication. Research has traditionally tested a linear relationship between alcohol and condomless sex—with each alcoholic beverage decreasing the odds of condom use (Simons et al., 2018). However, this assumption may be inaccurate. According to alcohol myopia theory, only moderate levels of intoxication (i.e., .08 g/dl) impede the ability to process distal cues (e.g., STI risk), and as blood alcohol levels approach .16 g/dl (e.g., 6 standard drinks consumed by a 170 lb. male in one hour), most behavioral skills are impaired (Mitchell, 1985; NIAAA, 2019). Additionally, when blood alcohol levels reach .30 g/dl and beyond, the pharmacological effects of alcohol cause an individual to lose consciousness, leading to extreme impairment in basic motor function, including sexual functioning (NIAAA, 2019). In light of this information, more recent research has begun to test the alcohol-condom use relationship as a curvilinear function, resembling an inverted-U shape. For example, Simons et al. (2018) found support of a curvilinear relationship between alcohol use and sexual activity in an event-level study with college students informed by dual-systems and alcohol myopia models. Moreover, there was evidence of an interaction between alcohol intoxication and self-regulation, such that participants low in self-regulation were more likely to engage in condomless sex as their level of intoxication increased—providing preliminary evidence of the utility of combining elements of dual-systems and alcohol myopia theories (Simons et al., 2018). Notably, inconsistent with hypotheses, there was no evidence of an interaction between alcohol intoxication and reward-seeking. To replicate the findings of Simons et al. (2018), this study tested a quadratic term of the number of standard drinks to detect a curvilinear effect.

The current study was conducted during an unprecedented time in history—in the midst

of the COVID-19 pandemic—which was not originally planned for during the development and design of this study. Attempts were made to account for the potential influence of the COVID-19 pandemic on the validity of results by modifying the timeframe of assessments, recruiting participants from various geographic locations, and incorporating psychosocial measures that may have fluctuated throughout the pandemic.

College Student Health Behavior during COVID-19

The COVID-19 pandemic was declared a national emergency on March 13, 2020. At this time, a variety of mitigation efforts were implemented to reduce virus transmission, including closing non-essential workplaces, limiting gatherings, and stay-at-home/shelter-in-place orders. Consequently, many secondary education institutions canceled residential instruction and closed on-campus resources—shifting educational activities to remote-learning. Given that college campuses are a unique psychosocial environment where college students spend the majority of their time, students across the country experienced drastic disruptions to their day-to-day lives as a result of these mitigation efforts. Research demonstrated that in the context of these disruptions college students experienced increased symptoms of depression, anxiety, and psychological distress (Charles et al., 2021; Copeland et al., 2021). Additionally, students reported changes in their alcohol consumption and sexual activity (Firkey et al., 2021; Graupensperger et al., 2021; Jackson et al., 2021; White et al., 2020). Specifically, college students have reported reduced frequency of alcohol consumption and reduced frequency of drinking in social settings (Firkey et al., 2021). Regarding sexual activity, college students reported decreases in opportunities to engage in sexual activity, number of sexual partners, and condom use (Firkey et al., 2021).

Notably, most published research on this topic reported data that were collected during the early stages of the pandemic, and thus comparisons of alcohol consumption and sexual

activity were largely made between pre-pandemic estimates while on campus, and during the initial phase of the pandemic while living at home with parents. Therefore, a knowledge gap remains regarding whether published patterns hold as students returned to college campuses during the Fall 2020 semester and throughout their adjustments to campus life as the pandemic evolved. Because many institutions implemented strict policies limiting social gatherings, routine COVID-19 testing, and hybrid learning models, it is possible that decreased rates of drinking and sex persisted. Alternatively, there is evidence suggesting that after extended periods of time of social isolation, college students may have increased engagement in social drinking and sexual activity even above and beyond historically typical rates, in reaction to prolonged periods of abstention/reduction (Charles et al., 2021).

Data collection for the originally designed version of the study began in February 2020, however, all study-related activities were suspended in March 2020, as per Syracuse University directives. Modifications to the original design of the study were made to account for the influence of the COVID-19 pandemic on college student alcohol consumption and sexual activity by assessing both behaviors pre-pandemic and throughout the resumption of residential instruction between the Fall 2020 and Fall 2022 semesters. During the Fall 2020 semester at Syracuse University, residential instruction was discontinued on November, 16, 2020 due to a COVID-19 outbreak (i.e., 283 active student cases) and the number of cases totaled 822 by the end of the semester (Syracuse University, 2022). This was indicative of non-adherence to mitigation guidelines related to limiting social-gatherings and other safety precautions (e.g., facial coverings). As the pandemic and associated public health guidance evolved, it is possible that college student alcohol consumption and sexual activity over the course of the COVID-19 pandemic is not representative of these behaviors under typical circumstances. Since the primary

aim of the original design of this study was to develop a model of college student alcohol-associated condomless sex, it is critical to account for the potential that the findings have limited generalizability for college student behavior outside of the COVID-19 era. Exploratory analyses were conducted to compare the utility of the model using data from both timeframes.

General Summary

Alcohol-associated condomless sex in college students remains a significant public health concern. The lack of a comprehensive theoretical framework that incorporates relevant constructs unique to college students prohibits the development of efficacious interventions. Such a model must be derived from, and supported by, well-designed event-level empirical studies that address the existing methodological limitations of the overreliance on self-report instruments of risk behavior correlates, unidimensional measurement of sexual relationship characteristics, and assumptions about the linear effects of acute alcohol intoxication. The purpose of the present study was to use a mixed-methods approach to construct a theoretical model of college student alcohol-associated condomless sex that combines the IMB, dual systems, and alcohol myopia models. The combined model can be used as the foundation for combination alcohol-STI prevention-interventions. A retrospective event-level design was used to test within- and between-person factors associated with condom use at the level of the sexual event. The study also gathered college student perceptions of condom use decision-making using qualitative interviews. This mixed-methods approach was selected to balance the preliminary stage of this line of research with its ultimate goal of constructing a theoretical framework from which a behavioral intervention to reduce alcohol-associated condomless sex in college students could be developed. The aims of the study were as follows:

Aim 1: The primary aim was to construct a combined model of college student alcohol-associated condomless sex. A sample of college students provided data related to decision-making processes and alcohol-associated sexual events using behavioral tasks and self-report measures. Multilevel structural equation modeling was used to evaluate a model containing constructs from the IMB (condom use information, condom use motivation, and condom use behavioral skills), dual-systems (self-regulation and reward-seeking), and alcohol myopia (number of drinks consumed prior to a sexual event) theories and to quantify the strength of the paths predicting condom use. It was hypothesized that the best-fitting model would contain elements from all three theories, and account for a larger proportion of variance in condom use than typically found in the literature (i.e., 10-20%; Albarracín et al., 2005; Baranowski, 2005).

COVID-19 Exploratory Aim: Given that the initiation of data-collection coincided with the onset of the COVID-19 pandemic, modifications to the study design were made to account for the widespread impact the COVID-19 pandemic exerted on the daily lives of college students, including their substance use and sexual activity (Firkey et al., 2021). To this end, the study also explored the extent to which the model identified in Aim 1 fit sexual activity data that occurred prior to the onset of the pandemic. This aim can aid in contextualizing the model constructed in Aim 1 and describe how alcohol-associated condomless sex may vary as students adjusted to campus life in the midst of the COVID-19 pandemic.

Aim 2: The secondary aim of this study was to identify supplementary factors that comprise college student alcohol-associated condomless sex decision-making that are not captured by the theoretical constructs of the IMB, dual systems, and alcohol myopia theories. Qualitative in-depth-interviews (IDIs) with a subset of participants were conducted using a semi-structured interview guide to gather perceptions of condom use decision-making processes and

identify constructs associated with alcohol-associated condomless sex that may have been unintentionally excluded from Aim 1. These data were used to complement the quantitative data collected in Aim 1 and allowed for a mixed-methods approach to construct a comprehensive model of college student alcohol-associated condomless sex.

Method

Overview

It is important to outline the significant changes to the original design and procedures of this study that were made in reaction to the unprecedented and unanticipated effects of the COVID-19 pandemic. Table 1 contains a summary of these modifications and their rationale. The primary modifications include: (1) Data-collection procedures were altered from a single in-person laboratory session to two virtual sessions that were conducted remotely. This change was made after the Psychology Research Participation Pool was closed and in accordance with Syracuse University policies regarding discontinuation of face-to-face data-collection for human-subjects research. (2) Recruitment efforts were made to enroll college students from across the country. This change was made to minimize the effects of localized mitigation efforts that varied greatly across geographic regions and maximize the potential to reach the target sample size. (3) Assessments of the impact of COVID-19 on the daily lives of college students were added to the self-report questionnaire battery. In addition, characteristics of the three most-recent sexual events participants engaged in prior to the onset of the COVID-19 pandemic were assessed. These changes were made to account for the potential influence the COVID-19 pandemic had on students' substance use and sexual behavior and allowed for a comparison of these behaviors after students returned to campus life in the midst of the pandemic. Modifications were made at various time points in reaction to the rapid evolution of the pandemic and associated mitigation

efforts/policy changes, and were approved by the study's committee members prior to implementation. These modifications were given careful consideration to balance a timely re-initiation of data-collection after disruptions to planned research activities, while accounting for the ways in which the COVID-19 pandemic may have affected the validity of the research.

The study was divided into two sections, a quantitative portion, and a qualitative portion. The quantitative portion consisted of Session 1 (i.e., electronic baseline survey containing self-report questionnaires) and Session 2 (i.e., videoconference meeting with study staff comprised of computerized behavioral tasks and interviewer-administered Timeline Followback [TLFB]). Participants who completed Session 2 were invited to participate in Session 3 – a 30-day follow-up meeting that consisted of an additional TLFB interview conducted via Zoom. Due to few participants electing to enroll in the 30-day follow-up session ($n = 5$), these data are not included here. Results of the quantitative data-analyses were used to develop an initial combined model of college student alcohol-associated condomless sex. This preliminary model was refined based on findings from the qualitative portion of the study.

The qualitative portion consisted of IDIs conducted via videoconference (i.e., Zoom). Participants were asked to provide their perceptions of factors that influenced their condom use and non-use during their most-recent sexual events. Specific questions regarding the role of alcohol use in these processes were also asked if the topic did not arise spontaneously.

Participants were eligible to participate in the study based on the following inclusion criteria: ages 18-25; > 1 drinking occasion in the previous 180-days; > 2 occasions of insertive/receptive vaginal intercourse in the previous 180-days, heterosexual (< 1 on the Kinsey Scale; Kinsey et al., 2003); and inconsistent condom use over the previous 180-days (>0% -

<100%). Participants were not eligible to participate in the study if they reported being in a monogamous romantic relationship, not fluent in English, or unable to provide informed consent.

Quantitative Study

Measures

Descriptive Measures.

Screening Measures. Participants completed a 7-item pre-screening questionnaire assessing gender identity, age, relationship status, sexual orientation (i.e., Kinsey scale; Kinsey et al., 2003), student status, and 180-day alcohol use and sexual activity (i.e., vaginal intercourse, condom use).

Sample Demographics. A questionnaire was administered to collect information on participant age, race, ethnicity, university/college location, and academic standing.

Sexual History Questionnaire. The Sexual Behavior Questionnaire (Maisto et al., 2002) was used to obtain self-reported number of lifetime sexual partners, number of sexual partners in the previous year, number of sexual partners in the last 3 months, past-year condom use frequency, and past-3-month condom use frequency. An additional item assessing lifetime history of a positive STI diagnosis was administered.

COVID-19. The Pandemic Stress Index (Harkness, Behar-Zusman, & Safren, 2020) was administered to describe the sample's experience of COVID-19 mitigation efforts, levels of adherence to them, and any recent symptoms or COVID-19 diagnoses. Additionally, an adapted version of the Adolescent Medicine Trials Network (ATN) for human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) Interventions COVID-19 questionnaire was used to assess the degree to which COVID-19 impacted general well-being, substance use, and sexual behavior (ATN, 2020). The adapted instrument excluded questions related to HIV

management and included questions regarding university closures. Participants reported COVID-19-related changes on a 5-point Likert-type scale (1 = highly decreased because of COVID-19 – 5 = highly increased because of COVID-19). Response options were collapsed into three categories: decreased/less, no change, increased/more (Firkey et al., 2021).

Between-Person Covariates.

Sex-Related Alcohol Expectancies. The Sex-Related Alcohol Expectancies questionnaire (Dermen & Cooper, 1994) was used to measure facets of sex-related expectancies of alcohol use: disinhibition, enhancement, and risk-taking. Responses were given on a 6-point Likert-type scale (1 = strongly disagree - 6 = strongly agree). Higher scores indicate stronger endorsement of expectancies. The scale demonstrated adequate reliability in this sample ($\alpha = .88$). The total scale score was entered as an exogenous covariate into the model.

Sexual Sensation Seeking. The 11-item Sexual Sensation Seeking Scale was used to assess the inclination for diverse sexual experiences and the willingness to take risks for the purpose of enhancing sexual sensations (Gaither & Sellbom, 2003; Kalichman et al., 1994). A 4-point Likert-type scale was used, with higher scores indicating greater propensity to engage in novel sexual experiences. The scale demonstrated good reliability ($\alpha = .77$) in this sample. The total scale score was entered as an exogenous covariate into the model.

Information-Motivation-Behavioral Skills Construct Measures.

Condom Use Information. The Sexual and Reproductive Health Knowledge Scale (Rahimi-Naghani et al., 2016), a 26-item measure that assesses four domains of sexual health knowledge: physiology, contraception, HIV/STIs, and condoms (e.g., “Condoms are an effective method of protecting against STIs”), was used to measure condom use information. Responses consist of “True,” “False,” and “Not sure,” with correct responses receiving a score of 2, and an

incorrect or uncertain response a 1, for a possible range of 26 – 52. The total scale score was entered as an exogenous variable into the model.

Condom Use Motivation. The UCLA Multidimensional Condom Attitudes Scale (Helweg-Larsen & Collins, 1994), is a 25-item measure that uses a 7-point Likert-type scale (1 = strongly disagree – 7 = strongly agree) to index five aspects of condom use attitudes: reliability and effectiveness, pleasure, identity stigma, embarrassment about negotiation, and use. This scale demonstrated good internal consistency in this sample ($\alpha = .85$). Based on other research applying the IMB model to HIV/STI prevention (Sheinfil et al., 2020), an additional item was used to assess condom use motivation: “How motivated were you to use a condom during sexual intercourse during the previous 90-days?” (1 = not at all motivated – 7 = extremely motivated). The total scale score was entered as an exogenous variable into the model.

Condom Use Behavioral Skills. Condom use is largely under the physical control of men, thereby placing a greater emphasis of negotiation on women (Holland et al., 1992; Maxwell & Boyle, 1995). Thus, to ensure condom use behavioral skills were sufficiently measured for male and female participants, this construct was assessed using a measure of condom use influence strategies. The Condom Influence Strategy Questionnaire (Noar et al., 2002) evaluates the implementation of seven strategies that ensure condom use (e.g., withholding sex) using a 5-point Likert-type scale (1 = very likely – 5 = very unlikely). This 42-item scale demonstrated excellent internal consistency ($\alpha = .97$) in this sample, as did each sub-scale (Withholding Sex $\alpha = .94$, Direct Request $\alpha = .96$, Seduction $\alpha = .90$, Relationship Conceptualizing $\alpha = .96$, STI Risk Information $\alpha = .94$, Deception $\alpha = .92$, Pregnancy Prevention $\alpha = .92$). The total scale score was entered as an exogenous variable into the model.

Dual Systems Measures. Reward-seeking and self-regulation were represented in the model by latent factors comprised of a behavioral task and self-report questionnaires indicators.

Reward-Seeking. Self-reported reward-seeking was measured by the UPPS-P Impulsive Behavior Scale (Lynam et al., 2006), a 45-item scale assessing five dimensions of impulsivity, which has shown adequate reliability and validity with college students (Cyders, 2013). The scale demonstrated good internal consistency ($\alpha = .91$), as did the reward-seeking latent variable sub-scales (Negative Urgency $\alpha = .85$, Sensation Seeking $\alpha = .83$, Positive Urgency $\alpha = .93$). The sum of each sub-scale was entered as the latent variable indicator into the measurement model.

The Balloon Analog Risk Task (Lejuez et al., 2002), was used as a behavioral indicator of reward-seeking. The task was administered via the PEBL battery software (PEBL v2.1, 2019) and requires participants to decide how much air to “pump” into a balloon before it overinflates and bursts. For each “pump” participants are awarded \$0.05 and have the opportunity to end the trial by collecting the total amount awarded. If the balloon bursts prior to collecting the reward, the trial ends without any compensation added to the participant’s balance. The average number of “pumps” per trial (50 total trials) was used as the latent variable indicator because it has been demonstrated to load strongly onto the reward-seeking factor in tests of the dual-systems model (Harden et al., 2017).

Self-Regulation. Self-reported self-regulation was assessed with the Future Orientation Scale (Steinberg et al., 2009), a 15-item questionnaire comprised of three factors: planning ahead, time perspective, and anticipation of future consequences. This scale demonstrated poor internal consistency in this sample ($\alpha = .42$). The Perseverance ($\alpha = .83$) and Premeditation ($\alpha = .87$) sub-scales of the UPPS-P were used as additional self-report indicators of self-regulation.

The sum of each sub-scale was entered as the latent variable indicator into the measurement model.

The Tower of London test (Shallice, 1982) was used as the behavioral indicator of self-regulation. The task was also administered via the PEBL battery software, and requires participants to engage in goal-oriented behavior through replicating a configuration of shapes using the fewest possible number of movements. The average amount of time before participants made their first move (i.e., time to first click) was used as the latent variable indicator because it has been demonstrated to load strongly onto the self-regulation factor in tests of the dual-systems model (Harden et al., 2017).

Within-Person Substance Use and Sexual Activity.

Timeline Followback. The TLFB is a calendar-assisted structured interview (Carey et al., 2001; Sobell & Sobell, 1992) and was used to assess multiple characteristics of discrete sexual events, including alcohol consumption, other substance use, sexual activity, sexual partner type, and condom use. The “Timeline” web-application (Wray et al., 2019) was used as the TLFB administration instrument. “Timeline” is a flexible data-collection tool that allows researchers to customize the recall period, behaviors of interest, and follow-up assessments. For this study, the recall period was set to 90-days to maximize capturing the greatest number of alcohol-associated sexual events participants engaged in, while balancing reliability (Napper et al., 2010). The interviewer used a “screen-share” function to facilitate the participant having visual cues (e.g., electronic calendar) throughout the interview to enhance accurate recall. The TLFB was only administered to participants who completed Session 2 (i.e., Zoom videoconference).

To assess *alcohol consumption*, the estimated number of standard alcoholic beverages consumed on each of the 90-days was reported. Any *other substance use* (e.g., cannabis,

stimulant, hallucinogen, etc.) was also reported daily. On days in which participants reported engaging in sexual activity, the specific sexual acts were reported (i.e., oral, vaginal, anal) and the characteristics of the sexual relationship were assessed. Specifically, participants were asked to categorize the *sexual partner type* as either “new” (i.e., someone they had sex with for the first time on that day), “casual” (i.e., someone they have not known for very long and had little commitment to), or “regular” (i.e., someone they had known for a while and had some commitment to). In addition, participants reported the date of the first sexual encounter with each partner, which was used to calculate the duration of the sexual relationship. The *context* in which the sexual encounter occurred was also assessed. Participants were asked “What was the context/situation/environment that led to engaging in sexual activity?” and response options consisted of multiple scenarios (e.g., “a date,” “a frat party,” “a pre-determined meetup for sex [booty call]”). The *sexual context* variable was dichotomized to characterize the sexual encounter as initiating following a group social activity (e.g., “frat party”), or a one-on-one activity (e.g., “a date”). *Condom accessibility* was assessed with the item “Was a condom easily accessible during this sexual encounter?” All of these variables were estimated at Level-1 in the analyses testing multilevel structural regression models fit to the TLFB data.

Most-Recent Sexual Events. An adapted version of the TLFB was used to assess the three most-recent sexual events participants engaged in prior to the onset of the COVID-19 pandemic. This computerized-assessment self-interview contained the same language used by the interviewer during the TLFB. However, it was modified to explicitly instruct participants to recall details regarding sexual events that occurred *before* March 13, 2020: “You are going to try to recall the details associated with the three most-recent sexual events you engaged in before March 13, 2020 (the date the US government declared a state of emergency). We will be asking

you detailed questions about each of the events separately. We encourage you to use anything and everything that would be helpful for your memory. Examples might be old text messages, social media applications (e.g., Snapchat memories, Tinder conversations), photos, or calendars.” An identical set of items included in the TLFB were used to assess alcohol consumption, other substance use, sexual activity, and sexual partner-type. Items used to assess *condom accessibility* and *sexual context* were excluded. This assessment self-interview was administered in conjunction with the other self-report questionnaires included in the Session 1 electronic survey.

Dependent Measure.

Condomless Vaginal Intercourse. As part of both the TLFB and most-recent sexual event assessment, participants reported whether they had used a condom during each of the assessed sexual behaviors (i.e., oral, vaginal, anal). Condomless intercourse was defined as any sexual activity during which a condom was not used for the *entire* duration of the act. The primary outcome variable was coded dichotomously as condomless vaginal intercourse (1 = yes, 0 = no).

Procedures

Recruitment. Participants were recruited between June 2020 – December 2021 from three sources: (1) a research study participant pool consisting of students enrolled in introductory psychology courses (i.e., SONA), (2) Amazon Mechanical Turk (MTurk) – an online labor market in which individuals are paid to complete online tasks and surveys, and (3) traditional (e.g., paper flyers) and social media-based (e.g., Reddit forum posts) advertisements. Figure 2 displays the flow of participant enrollment through the various recruitment approaches. All individuals who were interested in participating in the study completed a 7-item pre-screening questionnaire to determine whether they met the eligibility criteria to enroll in the study. The pre-

screening questionnaire, as well as all self-report questionnaires, were administered electronically via Research Electronic Data Capture (REDCap), a web-based, data-collection system that allows for secure collection and storage of data (<https://projectredcap.org/>).

Session 1. Individuals who were eligible to participate in the study were automatically re-directed to another electronic REDCap survey that contained an informed consent statement and self-report questionnaires (e.g., demographics, individual-difference characteristics, most-recent sexual event assessment). After completing the questionnaires, participants indicated their preferred time and date for completing Session 2 (all Session 2 meetings were conducted within 7 days of completing the Session 1 survey). Compensation for completing the Session 1 baseline survey differed based on recruitment source: SONA participants received 1 course credit, MTurk participants received \$0.51 (\$0.01 for completing the pre-screening questionnaire) and one entry for a \$150 gift card, and all other participants received three entries for a \$150 gift card. The average duration to complete the Session 1 electronic survey was approximately 57-minutes.

Session 2. Participants who elected to schedule a Session 2 meeting were sent a link for a Zoom meeting via e-mail. During the videoconference, study staff confirmed participants were in a secluded location to protect their privacy and confidentiality and reviewed details pertaining to the study procedures and their rights as participants (e.g., ability to withdraw without penalty at any point). After this introduction, study staff provided detailed instructions for downloading and installing the PEBL 2.1 behavioral task software. Participants were then asked to carefully read the instructions for each of the behavioral tasks (i.e., BART, ToL) and the interviewer turned off their microphone and camera while the participant completed the task in an attempt to mirror the conditions in which the task would have been completed in a laboratory setting. After completing both computer tasks, the interviewer administered a 90-day TLFBI interview using

the “Timeline” web-based application that assessed alcohol consumption, other substance use, and sexual activity (e.g., vaginal sexual activity, sexual partner type, condom use). The Zoom “screen share” function was used to show participants the “Timeline” application graphical user-interface (i.e., electronic calendar and questions). Compensation for completing the Session 2 Zoom meeting differed based on recruitment source: SONA participants received 1 course credit, MTurk participants received \$5.00 and three entries for a \$150 gift card, and all other participants received \$5.00 and five entries for a \$150 gift card.

Quantitative Data Analysis Plan

All analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 26 (SPSS, 2019), Mplus 7.4 (Muthén & Muthén, 1998-2017), and Microsoft Excel (2016). The criterion for statistical significance was set to an alpha level of 0.05.

Power Analysis. An *a priori* power analysis was conducted (Westland, 2010) using the Power In Two-Level Designs (PINT) v.212 software (Bosker et al., 1996; Snijders & Bosker, 1993) and an *a priori* sample size for structural equation models calculator (Soper, 2022) to determine the sample size required to detect a specified effect given the structural complexity of the model. PINT estimates standard errors of regression coefficients to conduct power analyses for multilevel models. Based on previous research and published guidelines (Fisher, 2011; Scott-Sheldon et al., 2010; Walsh et al., 2011; Westland, 2010; Wolf et al., 2013), the results indicated a sample of $N = 200$ would provide power ($\beta = .80$) to detect an effect size $> .26$ at $\alpha = .05$, for a model with 15 manifest variables and 3 latent variables.

Preliminary Analyses. The author and a research assistant independently screened data collected from each participant to assess for adequate data quality. Data quality was assessed using attention checks integrated into the REDCap electronic survey, response consistency (e.g.,

identify as female on the pre-screening questionnaire but subsequently identify as male on the demographics questionnaire), and multiple attempts to enroll in the study (e.g., >1 attempt to complete the pre-screening questionnaire). Data flagged for poor quality were discussed, and a conservative approach was taken to exclude data from any participant identified as potentially disingenuous. Descriptive statistics (e.g., mean, standard deviation) for all variables and Cronbach alpha coefficients for relevant measures were computed. Chi-square analyses and Analyses of Variance (ANOVA) were conducted to test for differences in participant demographic characteristics by recruitment source to determine whether there were any differences between the three sub-samples.

Primary Analysis. Multilevel structural equation modeling was used to evaluate a combined model of college student alcohol-associated condomless sex. Multilevel modeling procedures allow for analyzing data that have a nested multilevel structure, which for these analyses, constitutes sexual events (Level-1) nested within participants (Level-2). Therefore, the within-person relationship between alcohol consumption and condom use was modeled for each participant individually (Level-1) and the average relationship across all participants was modeled separately (Level-2). In addition, because data collected using self-report questionnaires and behavioral tasks were used to index the dual-systems constructs, a multilevel regression model was estimated to create the Level-2 latent variables of reward-seeking and self-regulation. Due to the dichotomous-nature of the condom use endogenous variable, multilevel logistic regression models were tested using full information maximum likelihood estimation with robust standard errors to account for missing data and any variables with non-normal distributions.

Using the TLFB data collected during Session 2, Level-2 was defined by participant ($N = 58$) and Level-1 was defined by vaginal sexual activity events ($n = 701$) nested within

participants. Between-person differences (sample-mean centered) were partitioned from within-person fluctuations in event-level predictors (person-mean centered) to account for between-person trends. The *a priori* model included gender identity, age, sexual sensation seeking, and sex-related alcohol expectancies as exogenous covariates. Level-2 exogenous variables included: IMB model constructs – condom use information, motivation, behavioral skills; Alcohol Myopia constructs – average number of standard drinks consumed during sexual events (between-person centered); dual-system constructs modeled as two latent factors – *reward-seeking* comprised of the BART, Sensation Seeking, Positive Urgency, and Negative Urgency UPPS-P sub-scales as observed indicators, and *self-regulation* comprised of the ToL, Future Orientation Scale, and Premeditation and Perseverance UPPS-P sub-scales as observed indicators.

Level-1 exogenous variables included: latent factor of *sexual partner type* (i.e., categorical description of sexual relationship [0 = new, 1 = casual, 2 = regular]; duration of sexual relationship in days), number of standard drinks consumed on sexual activity day (within-person centered), other substance use (dichotomous 1 = yes, 0 = no), condom accessibility (dichotomous 1 = accessible, 0 = inaccessible), and sexual encounter context (dichotomous 1 = group activity, 0 = one-on-one activity). In addition, a quadratic term for number of standard drinks was tested (number of drinks²) to detect potential curvilinear effects (Simons et al., 2018). The endogenous variable was a dichotomous measure of condomless vaginal intercourse (1 = yes, 0 = no). Interaction terms between variables of interest (e.g., condom use motivation by alcohol consumption) were tested to characterize preliminary interrelationships among constructs from the various theories. However, these interaction terms were either non-significant, or led to a failure in the model to converge, and were thus excluded from the present analyses.

First, a measurement model was estimated to ensure that the latent variables provided sufficient fit to the data. Observed indicators were constrained to load onto their respective latent variables. Measurement model fit was assessed using published guidelines (Hu & Bentler, 1999; Ryu, 2014) of various fit indices (e.g., Tucker Lewis Index). Any indicator that did not significantly load onto the latent variable was removed. Additionally, adjustments to the measurement model were made to improve model fit, such that covariance terms between variables were added to allow for the free estimation of parameters based on a value >10 using the MODINDICES function in Mplus (Muthén & Muthén, 1998 - 2018).

After a measurement model that provided the best fit to the dual-systems data was established, a saturated model was then estimated in which all possible pathways between variables were fit. Subsequently, non-significant paths were trimmed iteratively, until adequate model fit was obtained. Because of the multilevel structure of the model, only the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), sample-size adjusted BIC (sa-BIC), and results of log-likelihood difference-testing were available to assess model fit (Finch & Bolin, 2017; Muthén & Muthén, 1998-2017; Ryu, 2014). Improvement in model fit was considered a decrement of \geq six units in AIC, BIC, and sa-BIC (Finch & Bolin, 2017). Unstandardized coefficient estimates, standard errors (SEs), standardized coefficient estimates, adjusted odds ratios (aORs), and 95% Confidence Intervals (95% CIs) are reported.

COVID-19 Exploratory Analysis. An identical set of steps outlined for the primary analysis was repeated for the exploratory analyses, but the data used in this analysis were from the three most-recent sexual events data collected during Session 1. Level-2 was defined by participant ($N = 128$) and Level-1 was defined by most-recent sexual events ($n = 348$) nested within participants. This model only differed from the primary analysis in that sexual encounter

context and condom accessibility were not measured, and recruitment source was entered as an exogenous covariate. Due to concerns related to insufficient statistical power that would limit the accuracy of the estimates, no interaction terms were entered into any of the exploratory models.

The power-analysis suggested that a sample of $N = 200$ would be sufficient to detect the anticipated effects given the multilevel structure of the data and number of estimated parameters and variables. However, because data were collected from only 58% of the target sample-size, an alternative single-level model was estimated to account for the potential of increased Type I and Type II errors resulting from under-powered multilevel analyses. This alternative model differed from the multilevel structural logistic regression model described above, in that the proportion of condomless vaginal intercourse was calculated for each participant as a continuous endogenous variable using responses on the most-recent sexual event assessment. Therefore, a single-level structural regression model was estimated using the COMPLEX command in Mplus to account for repeated-measures assessments. Additionally, an *a priori* sensitivity analysis was conducted in which the data entered in the model were restricted to only include sexual events within a 12-month period from the assessment date to account for any potentially biased retrospective reporting resulting from memory deterioration.

Quantitative Results

Participant Characteristics

Table 2 displays descriptive statistics of participants enrolled in the study. Most participants were recruited through the SONA research participation pool (71%). Participants were primarily White (69.53%) college freshman (50%). The average age was 19.95 years, and 60.16% identified as female. The average number of sex partners over the past 90-days was 2.55 ($SD = 1.99$), the average number of sexual encounters while using a condom over the past 30-

days was 1.39 ($SD = 2.40$), and the average number of sexual encounters without using a condom over the past 30-days was 1.57 ($SD = 2.97$). ANOVA (continuous variables) and Chi-square (categorical variables) analyses comparing demographic characteristics of participants from each recruitment source revealed significant differences in terms of age, history of COVID-19 diagnosis, and history of STI diagnoses. Consequently, recruitment source was modeled as a between-person covariate in the exploratory analyses to account for these demographic differences. A correlation matrix of Level-2 variables is presented in Table 3.

COVID-19 Characteristics

Overall, there were high rates of testing for COVID-19 ($n = 108$; 84.38%), with only 13.28% of the sample ($n = 17$) ever testing positive for COVID-19. The majority of participants ($n = 90$; 70.13%) reported experiencing a “slight decrease” in their general quality of life due to the COVID-19 pandemic. Most reported a “slight increase” in anxiety ($n = 73$; 57.03%), “no change” ($n = 57$; 44.53%) or “slight increase” in depression ($n = 53$; 41.41%), and “no change” in sleep ($n = 62$; 48.44%), due to the COVID-19 pandemic. In relation to alcohol consumption during the COVID-19 pandemic, most participants reported “no change” ($n = 36$; 28.13%) or “slight increase” ($n = 48$; 37.50%) in the frequency of alcohol consumption, but “no change” ($n = 56$; 43.75%) in alcohol consumption quantity. In terms of sexual activity during the COVID-19 pandemic, the majority of participants reported “no change” ($n = 34$; 26.56%) or “slight decrease” ($n = 44$; 34.38%) in opportunities to engage in sexual activity, “no change” ($n = 44$; 34.38%) or “slight decrease” ($n = 34$; 26.56%) in frequency of sexual activity, “no change” ($n = 49$; 38.28%) in the number of sexual partners, and “no change” in frequency of condom use ($n = 99$; 77.34%). These reports indicate there were not major self-reported differences in alcohol consumption, sexual activity, or condom use because of the COVID-19 pandemic.

90-Day Timeline Followback Characteristics

On the 1,273 alcohol consumption days, there was an average report of 5.91 ($SD = 4.47$) standard drinks per drinking day, with 64% characterized as heavy drinking days (i.e., $\geq 4/5$ standard drinks for women/men). Of the 756 sexual activity days, participants reported engaging in oral intercourse during 82% (99.19% condomless), vaginal intercourse during 88% (59.64% condomless), and anal intercourse during 1% of events (75% condomless). The most frequently reported sexual partner type was “Regular” (58.60%), followed by “Casual” (25.45%), and “New” (16.01%). Participants reported consuming alcohol during 37% of the vaginal sex events, with an average of 3.56 standard drinks ($SD = 5.63$; range = 0 – 32) per event, and engaged in other substance use during 45% of the events. Condomless vaginal intercourse in conjunction with alcohol use was reported during 54% of events, with an average of 7.61 standard drinks ($SD = 5.82$, range = 0 – 14) per event. Participants reported engaging in sexual activity with a partner of an unknown STI status during 34.13% of sexual events (33.72% condomless; Table 4).

Three Most-Recent Sexual Events Prior to COVID-19 Characteristics

A total of 348 sexual events were reported (Table 5). During these events, 59.77% were characterized by participants engaging in oral intercourse (80.29% condomless), 91.38% in vaginal intercourse (43.08% condomless), and 10.34% in anal intercourse (41.67% condomless). The most frequently reported sexual partner type was “Regular” (40.52%), followed by “New” (35.06%), and “Casual” (24.43%). The average proportion of condomless vaginal intercourse was 44.17%. Participants reported engaging in sexual activity with a sexual partner with an unknown STI status on 27.25% of events (34.07% condomless). Participants reported consuming alcohol during 60% of the sexual events, with an average of 2.52 standard drinks ($SD = 3.78$; range = 0 – 20) and engaged in other substance use during 20.88% of events.

Primary Analysis

90-Day Timeline Followback Measurement Model. First, a measurement model was estimated to create the two dual-systems latent variables: *reward-seeking* and *self-regulation*. The *a priori* hypothesized measurement model included the BART, Sensation Seeking, Positive Urgency, and Negative Urgency UPPS-P subscales as observed indicators of *reward-seeking*, and the ToL, Future Orientation Scale, and Premeditation and Perseverance UPPS-P subscales as observed indicators of *self-regulation*. A latent variable was also created for *partner-type*, which included: sexual relationship duration (in days) and sexual partner type category. The initial measurement model failed to converge, due to an inability of the *partner-type latent variable* to be estimated. As such, this latent variable was not estimated in any subsequent models, and categorical *sexual partner type* (0 = new, 1 = casual, 2 = regular) was entered as a Level-1 observed exogenous variable.

The next iteration of the measurement model did not yield adequate fit to the dual-systems model data ($\chi^2(13) = 54.46, p < .001, RMSEA = .07, CFI = .71, TLI = .52, SRMR = .17, AIC = 2956.80, BIC = 3056.95, sa-BIC = 2987.10$). Further, standardized factor loadings demonstrated low and non-significant loadings for the BART ($\lambda = -.39$) on the *reward-seeking* factor and for the ToL ($\lambda = .11$) on the *self-regulation* factor. Thus, the *a priori* hypothesized measurement model containing the behavioral tasks demonstrated inadequate fit to the data, and were subsequently dropped. The measurement model providing the best fit to the dual-systems data contained Positive Urgency ($\lambda = .63$) and Negative Urgency ($\lambda = .90$) UPPS-P sub-scales as indicators of *reward-seeking*, and Premeditation ($\lambda = .70$) and Perseverance ($\lambda = .73$) UPPS-P subscales as indicators of *self-regulation* ($\chi^2(6) = 48.24, p < .001, RMSEA < .001, CFI = 1.00,$

TLI = 1.05, SRMR = .02, AIC = 1437.15, BIC = 1496.31, saBIC = 1455.04). This measurement model was retained for the model fit to the TLFB data.

90-Day Timeline Followback Multilevel Logistic Regression Model. A saturated multilevel structural logistic regression model was fit to the TLFB data in which all potential paths between the Level-2 covariates, exogenous observed variables, exogenous latent variables, and between the Level-1 exogenous observed variables were estimated. The parameters generated from this saturated model were used to compare improvement in model fit as each path was trimmed. Notably, Mplus does not support the estimation of cross-level covariance pathways and thus, this model was not a true saturated model based on the conventional definition. This model was considered a saturated model for the purposes of establishing the initial overall model fit indices, and amount of variance explained in event-level condom use. These parameters were used to compare improvement in model fit as each path was trimmed.

This original saturated model did not converge, which may have been due to the number of estimated pathways surpassing the number of Level-2 clusters (i.e., number of participants). Consequently, the decision was made to iteratively trim paths between a latent variable indicator (e.g., Perseverance UPPS-P subscale) and exogenous observed variables and covariates (e.g., sexual sensation seeking), as these paths did not directly predict condomless vaginal intercourse, and thus considered secondary to the primary hypotheses. Additionally, the paths between Level-1 exogenous variables were also trimmed (e.g., other substance use with number of standard drinks) to facilitate convergence of the saturated model. These decisions aimed to preserve the greatest number of paths estimated in the initial model to resemble a true saturated model as closely as possible. The first iteration of the model that successfully converged (Appendix A) was considered the saturated model (AIC = 38075.73, BIC = 38548.89, sa-BIC = 38218.67), and

accounted for a significant amount of variance in condom use at Level-1 ($R^2 = .60$), but not at Level-2 ($R^2 < .001$)—indicating all the variance was accounted for by between-person factors.

Non-significant paths were trimmed iteratively, and the improvement in AIC, BIC, and sa-BIC were examined, as well as statistically-significant changes in log-likelihood tests. The final model that demonstrated the best fit to the TLFB data is depicted in Figure 3 ($\chi^2(36,56) = 4798.21, p < .001$; AIC = 2719.41, BIC = 2883.19, sa-BIC = 2768.89). This model consisted of significant paths predicting event-level condomless vaginal intercourse from the following Level-2 exogenous observed variables, such that lower levels of **baseline condom use** ($b = -1.56, S.E. = 0.15, \beta = -0.48, aOR = 0.77, 95\% CI [0.62, 0.88], p < .001$), higher levels of **sexual sensation seeking** ($b = 0.17, S.E. = .05, \beta = 0.30, aOR = 1.09, 95\% CI [1.01, 1.23], p < .001$), lower levels of **condom use information** ($b = -0.34, S.E. = .16, \beta = -0.30, aOR = 0.81, 95\% CI [0.67, 1.00], p < .001$), and lower levels of **condom use motivation** ($b = -0.59, S.E. = 0.20, \beta = -0.35, aOR = 0.88, 95\% CI [0.74, 0.97], p < .001$) were associated with an increased likelihood of condomless vaginal intercourse. There were also significant associations between self-regulation and reward-seeking ($b = 18.56, S.E. = 5.48, \beta = 0.65, p < .001$), condom information and reward-seeking ($b = -8.2, S.E. = 2.74, \beta = -0.41, p < .001$), sexual sensation seeking and reward-seeking ($b = 15.95, S.E. = 5.82, \beta = 0.40, p < .001$), baseline condom use and condom use motivation ($b = 1.15, S.E. = 0.18, \beta = 0.70, p < .001$), condom use information and condom use motivation ($b = -1.15, S.E. = 0.42, \beta = -0.24, p < .001$), condom use motivation and sexual sensation seeking ($b = -2.51, S.E. = 0.84, \beta = -0.27, p < .001$), and number of standard drinks and sexual partner-type ($b = -0.39, S.E. = 0.16, \beta = -0.12, p = .02$).

At Level-1, each additional **standard drink unit** above the participant's own average was associated with a 6% increase in the odds of engaging in condomless vaginal intercourse (b

= 0.06, S.E. = 0.02, $\beta = 0.10$, aOR = 1.06, 95% CI [1.02, 1.10], $p = .008$). Greater level of **sexual partner type** familiarity was associated with a 375% increased likelihood of engaging in condomless vaginal intercourse ($b = 1.32$, S.E. = 0.58, $\beta = 0.36$, aOR = 3.75, 95% CI [1.21, 11.62], $p = .004$). Additionally, **condom accessibility** was associated with greater than 99% decreased odds of engaging in condomless vaginal intercourse ($b = -5.44$, S.E. = 0.96, $\beta = -0.67$, aOR = 0.004, 95% CI [.001, .03], $p < .001$), and compared to a 1-on-1 setting, **sexual encounter context** characterized as following a public/group setting was associated with 400% increased odds of condomless vaginal intercourse ($b = 1.39$, S.E. = 0.51, $\beta = 0.25$, aOR = 4.02, 95% CI [1.48, 10.91], $p = .003$). This model explained a large proportion of variance in event-level condom use at Level-2 ($R^2 = .76$) and at Level-1 ($R^2 = .56$). An alternative model was tested in which a quadratic term of within-person standard number of drinks was entered to test potential curvilinear effects, however, this model did not significantly differ from the one presented above. Therefore, the original within-person centered number of standard drinks variable was used to facilitate interpretation of the results.

COVID-19 Exploratory Analyses

Most-Recent Sexual Event Measurement Model. A multilevel structural regression model fit to data from the three most-recent sexual events prior to the onset of the pandemic was estimated to comparatively contextualize alcohol-associated condomless sex during the COVID-19 pandemic. The same *a priori* measurement model described in the primary analysis was estimated to create the dual-systems latent variables, however, this model also did not yield adequate fit to the dual-systems model data. The measurement model providing the best fit to the dual-systems data contained Positive Urgency ($\lambda = .60$) and Negative Urgency ($\lambda = 1.17$) UPPS-P sub-scales as indicators of *reward-seeking*, and the Future Orientation Scale ($\lambda = -.45$),

Premeditation ($\lambda = .56$) and Perseverance ($\lambda = 1.01$) UPPS-P subscales as indicators of *self-regulation* ($\chi^2(16) = 9.24, p = .056, RMSEA = .06, CFI = .95, TLI = .86, SRMR = .09, AIC = 3147.77, BIC = 3208.75, saBIC = 3157.96$). This measurement model was retained for all subsequent multilevel structural regression models fit to the most-recent sexual event data.

Most-Recent Sexual Event Multilevel Logistic Regression Model. A saturated multilevel structural logistic regression model was fit to the most-recent sexual event data in which all potential paths between the Level-2 covariates, exogenous latent variables, exogenous observed variables, and Level-1 exogenous observed variables were estimated. This original saturated model did not converge, which was likely due to the number of estimated pathways surpassing the number of Level-2 clusters (i.e., number of participants). Consistent with the primary analysis, paths considered to be secondary to the primary hypotheses were iteratively trimmed. The first iteration of the model to converge was used as the saturated model (Appendix B). This model accounted for a significant amount of variance in condom use at Level-2 ($R^2 = .76$), but not at Level-1 ($R^2 = .007$; $AIC = 7848.20, BIC = 8260.07, sa-BIC = 7920.64$).

Non-significant paths were trimmed iteratively, and the improvement in AIC, BIC, and sa-BIC were examined, as well as statistically-significant changes in log-likelihood tests. The final model that demonstrated the best fit to the most-recent sexual event data is depicted in Figure 4 ($\chi^2(73,111) = 2161.37, p < .001$; $AIC = 4771.99, BIC = 4902.97, sa-BIC = 4795.11$). This model demonstrated: higher levels of **sexual sensation seeking** ($b = 0.12, S.E. = .03, \beta = 0.37, aOR = 1.14, 95\% CI [1.20, 1.54], p < .001$), lower levels of **baseline condom use** ($b = -0.64, S.E. = 0.23, \beta = -0.34, aOR = 0.88, 95\% CI [0.74, 9.99], p = .004$) and lower levels of **condom use motivation** ($b = -0.48, S.E. = 0.16, \beta = -0.47, aOR = 0.78, 95\% CI [0.47, 0.95], p < .001$), were significantly associated with increased likelihood of condomless vaginal intercourse.

There were also significant associations between condom use motivation and self-regulation ($b = 1.81$, $S.E. = 0.77$, $\beta = 0.29$, $p = .001$), and baseline condom use and condom use motivation ($b = 1.31$, $S.E. = 0.18$, $\beta = 0.70$, $p < .001$). To preserve the multilevel structure of the model, a non-significant Level-1 exogenous variable of number of standard drinks was retained as a predictor of condomless vaginal intercourse ($b = 0.04$, $S.E. = 0.06$, $\beta = 0.05$, $aOR = 1.04$, $95\% CI [0.92, 1.18]$, $p = .53$). This model explained a large proportion of variance in event-level condom use at Level-2 ($R^2 = .68$), and a non-significant proportion of variance at Level-1 ($R^2 = .002$). An alternative model was estimated in which a quadratic term of within-person centered standard number of drinks was used to test potential curvilinear effects, however, this model did not significantly differ from the model presented above, and the term was dropped.

Most-Recent Sexual Event Sensitivity Analysis. A sensitivity analysis was conducted in which data were restricted to only include sexual events within 12-months from the assessment date to account for potentially biased reports resulting from memory deterioration. The measurement model that provided the best fit to the most-recent sexual event data that occurred within the previous 12-months from the assessment date was identical to the measurement model used in the primary analysis, with the only modification being an added covariance term between the Positive Urgency UPPS-P subscale and the Future Orientation Scale. Results of the sensitivity analysis were almost indistinguishable to those of the primary analysis, including the variables retained in the final model, the direction of the relationships, and the magnitude of the between- and within-person effects.

Most-Recent Sexual Event Structural Regression Model. Because the results of the multilevel model indicated that the data only explained a significant proportion of the variance in condom use at the between-person level, a single-level model predicting the proportion of

condomless vaginal intercourse was estimated. The COMPLEX command was used to account for repeated-measures assessments. The same measurement model used in the primary analysis demonstrated the best fit for this single-level structural regression model ($\chi^2(16) = 9.72, p = .05$, RMSEA = .07, 90% CI [.01, .12], CFI = .93, TLI = .84, SRMR = .08, AIC = 10368.01, BIC = 10428.99, sa-BIC = 10378.24). The Positive Urgency ($\lambda = 0.60$) and Negative Urgency ($\lambda = 1.12$) UPPS-P subscales significantly loaded onto *reward-seeking*, and the Future Orientation Scale ($\lambda = -0.43$), Perseverance ($\lambda = 1.01$) and Premeditation ($\lambda = 0.54$) UPPS-P subscales significantly loaded onto *self-regulation*.

A saturated structural regression model was fit to the most-recent sexual event data with the proportion of condomless vaginal intercourse estimated as a continuous endogenous variable. This saturated model resembled the *a priori* hypothesized model, in that the same variables were estimated. Similar to the other saturated models that were attempted to be estimated, this saturated model did not converge. Thus, paths between the observed exogenous indicators and exogenous variables/covariates were iteratively trimmed until the model successfully converged. The saturated model did not yield adequate fit to the proportion of condomless sexual activity during the most-recent sexual event data ($\chi^2(37) = 160.11, p < .001$, RMSEA = .09, 90% CI [.08, .11], CFI = .75, TLI = .19, SRMR = .09, AIC = 23954.53, BIC = 24399.47, sa-BIC = 24040.95), and accounted for a significant amount of variance in condom use ($R^2 = .51$).

The final model demonstrating the best fit to the proportion of condomless vaginal intercourse during the most-recent sexual event data is depicted in Figure 5 ($\chi^2(26) = 28.14, p = .35$, RMSEA = .02, 90% CI [.00, .04], CFI = .99, TLI = .98, SRMR = .07, AIC = 14766.93, BIC = 14912.62, sa-BIC = 14795.23). This model consisted of significant paths predicting the proportion of condom use such that higher levels of **sexual sensation seeking** ($b = 0.02$, S.E. =

0.004, $\beta = 0.26$, $p < .001$), lower levels of **baseline condom use** ($b = -0.11$, S.E. = 0.04, $\beta = -0.23$, $p = .007$), and lower levels of **condom use motivation** ($b = -0.08$, S.E. = 0.02, $\beta = -0.39$, $p < .001$) were associated with a greater proportion of condomless vaginal intercourse. There were also significant associations between condom use motivation and self-regulation ($b = 1.74$, S.E. = 0.70, $\beta = 0.28$, $p = .001$), self-regulation and baseline condom use ($b = 1.66$, S.E. = 0.51, $\beta = 0.49$, $p < .001$), baseline condom use and condom use motivation ($b = 1.33$, S.E. = 0.18, $\beta = 0.67$, $p < .001$), and sexual sensation seeking and condom use motivation ($b = -2.57$, S.E. = 1.06, $\beta = 0.22$, $p = .011$). This model explained a substantial proportion of variance in the proportion of condomless vaginal intercourse during the most-recent sexual events ($R^2 = .48$). Results of this analysis largely replicated those of the exploratory multilevel structural regression model.

Quantitative Study Summary

Overall, results of the quantitative study demonstrated that constructs from the IMB (i.e., condom use information, condom use motivation), dual-systems (i.e., self-regulation, reward-seeking), and alcohol myopia (i.e., number of standard drinks) theories were retained in the models yielding the best fit predicting condomless vaginal intercourse. Additionally, baseline condom use, sexual sensation seeking, and condom use motivation were the strongest between-person predictors of condomless vaginal intercourse. The model fit to the TLFB data also demonstrated sexual partner type, condom accessibility, and sexual encounter context to be significant within-person predictors of condomless vaginal intercourse, and explained a large and significant proportion of variance at both Level-1 and Level-2. The quality and nature of the relationships between these constructs were examined further in the qualitative study.

Qualitative Study

Procedures

In-Depth-Interviews. In-depth-interviews (IDIs) were conducted immediately after participants completed the TLFB interview during Session 2 (i.e., Zoom videoconference). The “record” function in Zoom was used to record the audio/video content of the IDIs, which were later transcribed into de-identified transcripts. The content from the TLFB interview was used to remind participants about specific sexual events that were referenced during the IDIs. A semi-structured interview guide was used to generate discussion about participants’ perceptions regarding the relationship between alcohol and condom use. Specific topics included: factors that contribute to condom use, factors that contribute to condom non-use, differences between condomless and condom-protected sex events, and the influences of alcohol on condom use.

Qualitative Data Analysis

As recommended by the NIH Office of Behavioral Social Sciences Research, qualitative methodologies used in combination with quantitative approaches can maximize the public health impact of interventions (Creswell & Clark, 2019). In accordance with these recommendations, a mixed-methods approach was used to construct a comprehensive combined model of college student alcohol-associated condomless sex. Through methodological triangulation (Turner et al., 2017), integrating quantitative and qualitative approaches allows for the generation of inferences beyond that which each method could yield independently (Guetterman et al., 2019). As it pertains to theory development, merging participants’ rich descriptions of their lived experience with quantifiable measurement and statistical analyses of their behavior, offers a rigorous method for explaining psychological processes (Guetterman et al., 2019). A convergent triangulation approach was used to integrate the findings from the quantitative and qualitative aims of this study (Guetterman et al., 2019; Turner et al., 2017).

The IDIs with the target population were structured to gather participants’ perceptions

about factors contributing to their condom use. These data were used to add depth about the nature of the relationships between the constructs measured in the quantitative aim and to identify any determinants of condom use that may have been overlooked by the health behavior theories tested in Aim 1 which serve as the basis of the combined model.

The IDI transcripts were uploaded to the secure qualitative analysis software program “Dedoose” (<http://www.dedoose.com>). Thematic analysis (Guest, MacQueen, & Namey, 2011; Miles & Huberman, 1994), was used to code the IDIs. A multilayered coding strategy was developed, such that the interviews were read multiple times to identify major unifying themes and sub-themes in the data. Themes and sub-themes were generated with the goal of organizing unifying topics that emerged from the data, and represented commonalities across participants (Thomas, 2006). A preliminary codebook was developed based on the initial themes and sub-themes, as well as the semi-structured interview guide. The codebook included codes, a brief definition, full definition, and guidelines for appropriate use, including an illustrative example of text (MacQueen, McLellan, Kay, & Milstein, 1998). Using the preliminary codebook, the author and a research assistant, independently coded a randomly selected excerpt. Coding discrepancies and difficulties were discussed, and the codebook was revised accordingly. The process was repeated, and another randomly selected excerpt was independently coded using the revised codebook. Again, any discrepancies were discussed, and the codebook was revised based on a discussion of ways to further refine the definitions and coding strategy. Subsequently, using the final coding structure, the remaining interviews were independently coded by the author and a research assistant. Both coders met to review coding selections for each interview, and any discrepancies were discussed until a consensus was reached. In sum, all 18 interviews were independently double-coded and no discrepant excerpts remained after consensus was reached.

Qualitative Results

Eighteen college students (6 male students, 12 female students) who completed Sessions 1 and 2 participated in the IDIs. The average duration of the IDIs was approximately 21-minutes. The majority identified as White (67%), Freshman (78%), and their average age was 18.67-years-old ($SD = 0.91$). Findings from of the IDIs were organized into two primary categories based on the themes and sub-themes derived from the codebook: (1) Perceived Factors that Contribute to Condomless Sex, and (2) Alcohol's Role in Condom Use. Illustrative quotes are presented based on overall representativeness of the central themes.

Perceived Factors that Contribute to Condomless Sex

Participants described a variety of reasons for foregoing condom use during sexual activity. Reasons varied as a function of partner-related factors (e.g., condom use abdication, partner risk perception), preferred method of contraception, perceived lack of pleasure when using a condom, and situation-specific circumstances (e.g., condom availability).

Partner Risk Perception. The most frequently cited reason for engaging in condomless sexual activity was the perceived risk level of the sexual partner. Participants described multiple indicators used to determine how “risky” a partner was, in terms of the likelihood of contracting an STI. Some participants reported they used visual inspections of their partner’s genitalia for physical evidence of an active STI.

“Other things I guess I would like look out for, it’s just any, like obviously any obscurities on genitalia, like signs of like herpes or something.” – Mixed-Race, Female, 18-year-old

“Like physical like the sores surrounding the mouth. Or if down there, I can like smell or something certain smell like little things like that then I’d be a little concerned.” – White, Male, 18-year-old

Other participants described conducting research into their partner's sexual history, such as gathering information about the number of sexual partners in their lifetime, or types of sexual behavior they have engaged in. Participants described fewer number of lifetime sexual partners instilled confidence that there would be a lower likelihood of contracting an STI.

"I guess this is more like on the social side of things, but if the person seems like they have engaged in many you know sexual activities in the past, I would be a bit, be a lot more reluctant in not using, in not using a condom. I would want to use one...If someone seems like they've engaged in many more than like, many more experiences than I have, I would be a lot more reluctant to not use one." – Hispanic/Latino, Male, 19-year-old

"Someone tells me the number of partners they've had so you know like if they've had a lot of multiple partners then I would be more concerned, cause like if someone had two partners versus like 15." – White, Male, 18-year-old

"I'll like look, do a little Instagram research and like typically like at least back home like, I had a bunch of friends who knew them. So, I would ask if there's anybody else that they're like engaging with." – Mixed-Race, Female, 18-year-old

Participants also reported using their instincts to judge a partner's social characteristics to determine whether they should use a condom to protect against potentially contracting an STI. Notably, most participants had difficulty articulating this concept, however, some stated there were indicators based on social interactions that informed their decision to forego using a condom, and to have confidence in this decision.

"You know and then in general it's a lot of like feeling you get of who they are when you're with them how they carry themselves, how they act, how they associate, you can kind of tell. Or like if I meet this girl and after 20-minutes she's already asking 'do you wanna go have sex?' I kind of think that like how many other guys has she met for 20-minutes and then asked 'do you wanna go have sex?' So it's more like that kind of thing it's not just one or two things." – White, Male, 18-year-old

"If I'm just getting weird vibes or have heard stuff more about their past, then, I'll probably be like no, you know, like save it for another day... Not anything else specific. Which is probably bad to just like go off vibes, but that is primarily it...some people you can kind of tell when they're like out to get something. Or like, looking more for like the like red flags." – White, Female, 19-year-old

Notably, there were only four participants who discussed their partner providing evidence of a recent STI test demonstrating their negative status. Therefore, the majority of participants relied on subjective methods to form opinions about the level of risk their partner posed.

Established Sexual Routine. Seventeen participants reported establishing sexual routines with their partner as a reason for not using condoms. Participants described that even if a condom was used during the first few instances they engaged in sexual activity, over time, condom use discontinued.

“I think that I didn’t use a condom on that day because its someone that I have slept with regularly and I know that I don’t see many other partners and neither do they. So, I’m not highly concerned about STDs and yeah. I guess that’s just an established thing with that partner.” – White, Female, 20-year-old

“We were just sort of hooking up over the summer. We had talked about, we would use condoms like twice in the beginning and then we talked about like STDs and all of that stuff, and had just then stopped using them and never really like talked about it again...it sort of just like you know became more of a routine.” – White, Female, 19-year-old

Although participants’ perceived level of monogamy influenced the degree to which condoms were incorporated into sexual activity, descriptions of the types of partners with whom they did/did not use condoms was not entirely consistent with the literature’s definition of “partner type.” For instance, participants reported discontinuing condom use after a single sexual encounter, regardless of whether their partner was engaging in sexual activity with others.

“I think that it comes up like in the second or third time or fourth time or whatever because um usually after a couple times you’re looking to make it better and you’re looking to not use one. So maybe I’ll go and try to have that conversation” – Hispanic/Latino, Male, 18-year-old

“It was just the second time I was seeing them, and we had actually after the first time when there was a condom...So, then the second time we didn’t feel a need to use a condom.” – Mixed-Race, Female, 18-year-old

Condom Use Abdication. Seven female participants, expressed the reason for not using a condom was due to their partner's preference. Some participants noted that even though their personal preference was to use a condom, they felt uncomfortable discussing the topic with their partner, and instead acquiesced the decision to use a condom to their partner's preference, which was most often, to engage in sexual activity without a condom. The reasons for the discomfort varied from feeling "awkward" discussing the topic of condoms, to feeling pressured to comply with their partner's request.

"My whole thing is like if I'm going out spending my time doing this, I may as well like, it's not like a pressure thing, but it's just like I might as well just like give them what they want if they don't want to use a condom then, I'm fine with it, then they don't have to use a condom. – Mixed-Race, Female, 18-year-old

Other participants described being concerned they would offend their partner by requesting he use a condom.

"I felt kind of obligated not to say anything because I didn't want him to get offended...I think maybe he'd get like embarrassed or like he just like not embarrassed I don't know how to say. I think he just judged me a little bit for asking and he was like a frat guy, so I don't really know what goes on in their minds but for what I've heard they just like hooking up with girls so. I just didn't really ask." – Asian/Pacific Islander, Female, 18-year-old

"I think on his end, it's because he didn't really mention it and on my end too, I was kind of nervous to mention it because he didn't mention it. So, I didn't think that I should mention it which is kind of weird...I'm normally a shy person, so like when big topics like that are brought to the table, I just fold, I guess. I do whatever that person wants to do, I guess. I think it's mainly like my personality." – Black/African-American, Female, 19-year-old

Another participant stated she did not want to jeopardize the potential to have sex by voicing her preference for condoms.

"I feel like I can't just, I can't be like please stop and put on a condom. I just, I just let things happen. I think it's just like not wanting to like ruin the mood, I guess...So just like not wanting to ruin the mood and just like letting things happen how they want it to cause

I don't want them to, I don't want them to be turned off." – Asian/Pacific-Islander, Female, 18-year-old

Although there were some male participants who reported their reason for not using a condom was related to a female partner's request, this description was not characterized by yielding to their partner's preference in opposition to their preference of using a condom. Rather, male participants who engaged in condomless sexual activity as a result of their partner's request, noted that not using a condom was consistent with their preference.

"She said in general that you know, she does find it more enjoyable without one like physically, and then she said that she was comfortable with me not using one, and I personally am fine with not using one too." – White, Male, 18-year-old

"She said she didn't want to use one, so like it was my decision whether or not I wanted to use one. I'm not really sure what, what I was thinking about at the time. I just like decided to just not use one and I basically just took the risk of, like, I wasn't caring about if I were to get anything. I just didn't." – Hispanic/Latino, Male, 19-year-old

Alternative Method of Contraception. Fifteen participants described electing to not use condoms because an alternative method of contraception (e.g., intrauterine device [IUD]) was used to prevent unwanted pregnancy. Both male and female participants noted that if the female party was using a reliable contraceptive strategy, there was confidence to forego using a condom.

"Typically, it's during the first time I'm, like hooking up with somebody, and they are wearing a condom, they'll ask if I'm on birth control and then they'll take it off." – Mixed-Race, Female, 18-year-old

"I'm on birth control so I felt like I was already protected enough from pregnancy. So, I felt that I didn't need to use a condom." – Asian/Pacific Islander, Female, 18-year-old

"I think she just trusted, she was just relying on that as her form of protection...and then me saying that I had successfully not used one in the past sort of like allowed her to just, you know not need me to have one." – Hispanic/Latino, Male, 19-year-old

Conversely, participants reported preferring to use condoms as an additional form of protection against unwanted pregnancy even if other methods of contraception were being utilized.

“Having a condom reduced like any stress that would, that may come up later on just because we were being, you know...using two forms of protection.” – Hispanic/Latino, Male, 19-year-old

“I am 19 years old and do not want a child. So, like anything that can stop that, I will take advantage of, and I feel like you can’t be too safe.” – White, Female, 19-year-old

Sexual Sensation Seeking. Thirteen participants described having a personal preference to engage in sexual activity without a condom due to increased pleasurable aspects of the encounter. For instance, both male and female participants stated the physical sensation of condomless sex is more pleasurable.

“Some people think that condoms make sex less fun and I do too. I think it feels better when a guy is not wearing one.” – Asian/Pacific Islander, Female, 18-year-old

“Probably just the experience of raw is more like preferable or pleasurable.” – White, Female, 20-year-old

Participants also noted that their preference to engage in sexual activity without a condom was to have a sense of enhanced intimacy with their partner. Condoms were described as creating an emotional barrier between the two individuals.

“I feel like the emotions like run through, it is just more, higher level of emotions when you have sex with that person. So sometimes it feels better to not have a condom during sex.” – Black/African-American, Female, 19-year-old

Condom Accessibility. A situation-specific factor that participants noted contributed to condomless sexual activity was whether a condom was easily accessible during the encounter. Many participants reported that they usually have condoms on-hand to be prepared for the possibility of engaging in sexual activity. Nonetheless, 14 participants described specific encounters during which there was no condom easily accessible, yet this did not deter them from engaging in sexual activity.

“I got to her house, and I didn’t have one [condom] and she didn’t have one. And we were drinking so we didn’t have like, we couldn’t drive anywhere to get one so. We kind

of trusted ourselves...But that didn't prevent us from having sex." – Declined to State, Male, 18-year-old

"I guess it depends on where I am and if we do have access to condoms. So, if we are at someone else's house or someone else's dorm, I'd say we don't really have access so...we probably wouldn't feel comfortable going around asking for an extra condom or something." – Asian/Pacific Islander, Female, 18-year-old

The Perceived Role of Alcohol Use in Condomless Sex

Participants were asked to give their impressions about the ways in which alcohol consumption influences their decision to use a condom during sexual activity. Perceptions about the role of alcohol consumption in condom use decision-making were inconsistent, some participants described alcohol consumption increasing the likelihood of engaging in condomless sex, yet other participants stated that alcohol had little impact on their decision to use a condom.

Pharmacological Effects of Acute Alcohol Intoxication. For those participants who expressed that alcohol consumption can promote condomless sex, their explanations were consistent with an alcohol myopia perspective. Specifically, participants described that while intoxicated, their attention is focused on rewarding aspects of their present circumstances, as opposed to potential negative consequences of condomless sex, such as contracting an STI. Some participants described this experience as being caught in the "heat of the moment".

"If I'm under the influence, you tend to be a bit more self-confident or social, so I feel like while making that decision and being under the influence, is pretty much, it's a lot easier for me to just, not care about anything else, or not really think about the consequences after the fact... Obviously, it influences your brain and can change you know how you make decisions. But I felt like yeah, while being under the influence and being presented that option, I just think I choose not to every time." – Hispanic/Latino, Male, 19-year-old

"When I'm intoxicated I kind of get impulsive and I just act at the heat of the moment without really thinking about the consequences or the benefits." – Asian/Pacific Islander, Female, 18-year-old

“I think we were both just caught in the heat of the moment... We were drunk, and stuff was happening so the condom didn’t even, the thought didn’t even cross my mind.” – White, Female, 19-year-old

“I feel as though my emotions are out of control; I’m not really thinking clearly if I’m more intoxicated. So, when I do feel that attraction, I do want to have sex with somebody, I feel as though I’m not going to think about wanting to use a condom; or that other person may not even think about wanting to use a condom, because they are so focused in the moment, and it slips their mind.” – Black/African-American, Female, 19-year-old

Other participants also described that alcohol consumption can lead to situations in which they were not prepared to engage in sexual activity, and thus did not have easy access to a condom. As a result, they were more likely to engage in condomless sex because of the unexpected nature of the encounter.

“I think just the role that alcohol plays is that it leads sometimes, can contribute to just like being in a social situation where I’m talking to new people, and then, potentially end up having sex with them. And its maybe alcohol leads me to not consider it or like it doesn’t lead me to say no to it, but not really think about it.” – White, Female, 20-year-old

“But yeah, maybe because I mean if I’m drinking, I may be not always planning on you know having activity, on the other hand if I was on a date, I’m probably gonna be prepared and have one for sure. And I guess when you’re drinking sometimes maybe I might open the possibility of you being unprepared for a situation like that.” – Hispanic/Latino, Male, 18-year-old

Alcohol has Little Influence on Condom Use. Seven participants expressed alcohol consumption having little impact on their decision to use condoms. Those participants described other factors having a stronger influence on their condom use, including personal preferences, as well as confidence in their ability to use condoms despite any alcohol-related impairment.

“Especially cause like if you don’t know like, you don’t know if they’re being honest with you about STDs or you know, you don’t know if they just don’t know, and they’ve never gotten tested. There’s a multitude of factors that...I mean, I feel like no level of intoxication will make me not use a condom.” – White, Male, 18-year-old

“For me personally, it doesn’t play a role in it. But like other people might be more careless if they’re drunk and like and they just like do stuff without thinking. But like me personally, even when I’m drunk, I always make sure I use one.” – Declined to State, Male, 18-year-old

“I’m like thick headed so like when, like if I’m drunk and someone wants to have sex and they are like let’s not wear one, I still will be like no we still should.” – White, Female, 19-year-old

Qualitative Study Summary

Overall, results of the qualitative study were largely consistent with the results of the quantitative study. No themes emerged that contradicted the structural equation models. Indeed, participants offered descriptions of the role of alcohol in condom use that is consistent with an *alcohol myopia* framework. Specifically, they noted that while intoxicated, they become caught in the “heat of the moment” with their attention focusing on rewarding aspects of the sexual encounter, potentiating the likelihood of engaging in condomless sex. Additionally, condom use abdication was identified as a potential mediator of the association between alcohol and condomless sex. Although not explicitly linked to any health behavior theory tested in Aim 1, between-person factors such as the physical pleasure associated with condomless sex (a facet of *sexual sensation seeking*) and typical condom use tendencies/preferences (i.e., *baseline condom use*) were described by participants as influencing their condom use.

Further evidence in support of the critical role of situation-specific aspects of sexual events also emerged. For instance, *condom accessibility* and *sexual partner characteristics* were cited as antecedents of condom use that may vary across encounters. Specifically, participants described gauging the level of STI risk associated with each *sexual partner* in a more nuanced way than a simple categorical measurement (i.e., “regular, casual, new”) used in the structural equation models. Partner preferences for condom use and partner-specific sexual routines were also indicated as *sexual partner characteristics* that can vary event-to-event. These explanations

highlighted the multifaceted nature of *sexual partner characteristics*, and indicated it was not adequately captured in the quantitative study. Ultimately, Aim 2 successfully identified complementary factors of college student alcohol-associated condomless sex which will be integrated with the quantitative results from Aim 1 into a comprehensive theoretical model.

Discussion

This study used a mixed-methods approach to construct a model of college student alcohol-associated condomless sex that combines elements from multiple health-behavior theories. In Aim 1, multilevel structural regression models were estimated to test the hypothesis that a model containing constructs from the IMB, dual-systems, and alcohol myopia models would explain a substantially larger proportion of variance in condomless sex compared to independent tests of each model. This prediction was partially-supported, in that the model providing the best-fit to the TLFB data contained constructs from all three theories, however, there were no main effects of the dual-systems constructs on condomless vaginal sex. Additionally, the hypothesis was supported in that this model explained a large proportion of variance in condom use at both the between- and within-person levels.

Results from the Exploratory Aim demonstrated the prevalence of condom-protected and condomless sex encounters was relatively consistent with similar samples who reported their behavior prior to the onset of the COVID-19 pandemic (e.g., Sheinfel & Woolf-King, 2021). Additionally, self-reported changes in the primary behaviors of interest (e.g., alcohol consumption, sexual activity, condom use) did not substantially differ as a function of the COVID-19 pandemic, a finding consistent with longitudinal studies (Bountress et al., 2022; Yarger et al., 2021). The structural regression model fit to the most-recent sexual event data contained substantial overlap with the model fit to the TLFB data; however, this model failed to

explain a significant proportion of variance at the within-person level, potentially due to underpowered analyses resulting from an insufficient number of within-person observations.

The IDIs conducted in Aim 2 gathered college student perceptions about factors influencing condom use and demonstrated substantial overlap with the health behavior theories used as the basis for the models tested in Aim 1. Additional themes emerged from the IDIs that were not included in Aim 1 which are relevant to alcohol-associated condomless sex, such as partner risk perception and condom use abdication. The results from Aims 1 and 2 will be synthesized to derive a combined model of college student alcohol-associated condomless sex.

Quantitative Event-Level Findings

The strongest between-person predictors of condomless vaginal intercourse were condom use motivation, sexual sensation seeking, and baseline condom use. There is an extensive body of evidence demonstrating a consistent pattern of results, in that greater levels of these three individual-difference characteristics are positively associated with condomless sexual activity (Albarracín et al., 2001; Fisher et al., 2014; Thorpe et al., 2021). Namely, past patterns of behavior, such as condom use, is one of the strongest predictors of future behavior (Albarracín et al., 2001). Additionally, condom use motivation was significantly associated with condom use, and may be the most amenable to change (Whiting et al., 2019), compared to more stable personality characteristics such as sexual sensation seeking. Notably, condom use behavioral-skills, a core construct of the IMB model, was not retained in the final models. This result diverges from other work that has found behavioral-skills to be a significant predictor of condom use (Chen et al., 2012). Nonetheless, this null finding is consistent with studies comprised of college student samples (Kiene & Barta, 2006; Sheinfil & Woolf-King, 2021). Given the overall

high levels of self-reported condom use behavioral-skills in this sample, it may be a less robust predictor of condom use in relation to other correlates (Kiene & Barta, 2006; Lewis et al., 2009).

Both models fit to the TLFB and most-recent sexual event data did not provide evidence of an association between self-regulation or reward-seeking and condom use. One possible explanation is that despite prior research indicating the best-fitting factor structure of the dual-systems model to be comprised of the ToL and BART (Harden et al., 2017), the multimethod assessment which used these behavioral tasks did not provide good fit to the data. Nonetheless, recent event-level studies that incorporate dual-systems model constructs have also failed to detect main effects of self-regulation and reward-seeking on condom use (Maisto et al., 2021; Simons et al., 2018). Instead, these studies demonstrated an interaction between self-regulation and alcohol intoxication, such that for those possessing lower levels of self-regulation, there was a stronger effect of alcohol intoxication on condomless sexual activity (Simons et al., 2018). There was no evidence of an interaction between reward-seeking and alcohol intoxication in this sample, however, this may be attributable to the analyses being underpowered to test moderation. Taken together, reward-seeking and self-regulation may not directly influence condom use decision-making processes, but rather functioning as stable trait-like tendencies, they may moderate the degree to which other predictors, such as alcohol consumption, affect condom use. Based on strong indications of an acute alcohol intoxication X self-regulation interaction on condom use (e.g., Simons et al., 2018), future research should incorporate this relationship into the study design.

Some event-level studies have found support of a positive association between alcohol consumption and condom use (Brown & Venable, 2007; Kiene et al., 2009; Scott-Sheldon, Carey, & Carey, 2010), yet a number of studies have failed to detect an event-level association.

In order to address potential methodological explanations for this null finding, the present study implemented novel indicators of alcohol use (i.e., quadratic function to detect curvilinear effects), as well as sexual partner type (i.e., relationship duration and partner category). Neither of the indicators used to index these within-person variables demonstrated good-fit to the TLFB or most-recent sexual events prior to COVID-19 data. Nevertheless, the present study offers some clarification to the mixed-findings in the event-level literature.

Indeed, the model fit to the TLFB data demonstrated multiple significant within-person predictors of condom use including alcohol consumption and sexual partner-type. Even though the variable entered into the model used to measure sexual partner characteristics was restricted to a categorical descriptor of sexual partner type, findings were consistent with other studies that have demonstrated increased likelihood of condomless vaginal intercourse with more familiar sexual partners (Brown & Vanable, 2007; Kiene et al., 2009). Moreover, although sample size limitations precluded the confidence of any moderation analyses, it is also anticipated that sexual partner characteristics also moderate the association between acute alcohol intoxication and condomless vaginal intercourse; such that, the likelihood of condomless vaginal intercourse with a less familiar sexual partner increases while acutely intoxicated. This can occur due to acute alcohol intoxication exerting more influence and promoting condomless sex in the context of emerging sexual routines, in which the use of condoms has not yet been established (Brown & Vanable, 2007). Therefore, future work can aim to further bolster the evidence-base for this event-level interaction. Other variables often omitted from the event-level literature also demonstrated robust within-person effects on condomless vaginal intercourse—condom accessibility and sexual encounter context.

Compared to sexual encounters during which there was no condom available, having easy access to a condom was associated with a 99% decrease in odds of engaging in condomless vaginal intercourse. This highlights the importance of facilitating easy access to condoms as a way to promote condom use (Eastman-Mueller et al., 2016). In addition, engaging in sexual activity after attending a social gathering (e.g., frat party) was associated with increased odds of condomless vaginal intercourse, even though >70% of all vaginal sexual activity occurred in the context of a one-on-one event (e.g., date). This finding can be understood from a dual-systems perspective, in that there is evidence the reward-seeking system activates and exerts more influence on risk-taking in the presence of peers (Shulman et al., 2016). As such, college students may be more likely to engage in condomless sex after social activity, which often co-occurs with alcohol consumption. Taken together, results of the multilevel model fit to the TLFB data provide support for the utility of event-level investigations that can test the within-person fluctuations in condom use as a function of situation-specific circumstances independent from, and in conjunction with, between-person individual-difference characteristics.

Notably, data collection for this study commenced prior to the rollout of COVID-19 vaccines, and thus vaccination prevalence in this sample is unknown. Therefore, it is not possible to discern the ways in which vaccination status may have influenced changes in the observed correlates of alcohol-associated condomless sex, such as social gatherings, or even in sexual activity itself—a behavior inherently high-risk for COVID-19 transmission (Cipriano et al., 2020). Thus, as college students became eligible, and eventually required, to receive COVID-19 vaccines, it is possible they felt more comfortable re-engaging in activities that are high-risk of transmission (e.g., social gatherings). Alternatively, in light of evidence suggesting emerging adults are at low-risk for developing severe illness from COVID-19 infection (Hutchins et al.,

2020), college students may have returned to their typical pre-pandemic activities upon returning to campuses for the Fall 2020 semester, prior to the advent of COVID-19 vaccines (Allen et al., 2021; Suffoletto et al., 2020). Indeed, college students may have been non-adherent to mitigation efforts that are difficult to monitor (e.g., large gatherings; Osberg & Doxbeck, 2021), compared to other mandatory strategies implemented by administrators (e.g., regular testing; wastewater surveillance; Scott et al., 2021). Nonetheless, findings from this study suggest that despite the timeframe during which these data were collected, the results are likely representative of general college student substance use and sexual activity regardless of COVID-19 pandemic effects.

Qualitative Results

There was considerable overlap between the perceived influences on condom use described by the participants in the IDIs and the constructs tested in the Quantitative Study. For example, the majority of participants described alcohol consumption as increasing the likelihood of engaging in condomless sex for reasons similar to those outlined by alcohol myopia theory (Steele & Josephs, 1990). Specifically, participants noted that acute alcohol intoxication leads to prioritizing the potential immediate rewarding aspects of the sexual encounter while disregarding the possibility of contracting an STI. Notably, some participants expressed that no amount of alcohol would interfere with their intentions to use condoms, yet this was the minority opinion.

A similar set of sexual event-specific factors measured in Aim 1 emerged in more detail as important contributors to condom use. For instance, in terms of sexual partner characteristics, establishing a sexual routine with specific partners often consisted of discontinued condom use as the relationship progressed over time. This is consistent with the broader literature identifying sexual partner type (e.g., new vs. regular) as an important predictor of condom use (Brown & Venable, 2007; Fehr et al., 2018). There were notable variations in the description of other

aspects of sexual partner type characteristics. For example, even while engaging in sexual activity with a new or casual partner, participants relied on subjective information, such as intuition or “vibes,” to make determinations about a partner’s level of STI risk. This perception-based risk assessment is similar to the concept of *unrealistic optimism*, or the misperception of the actual risk of experiencing a negative event (e.g., contracting an STI)—a process linked to alcohol-associated sex in college students (Lopez & Leffingwell, 2020). This diverges from the more linear explanation—as trust in the partner’s STI status develops over time, and level of familiarity increases, condom use decreases (Gómez & Marín, 1996; Macaluso et al., 2000).

The other major theme that emerged from the IDIs omitted from the quantitative data, was condom use abdication. Primarily female participants described deferring the decision to use a condom to their male partners for a variety of reasons, including discomfort discussing condoms in general, concerns about offending their partners and jeopardizing the encounter, and a sense of obligation to their partner’s condom use preferences. Male participants also expressed complying with their female partner’s request to forego using a condom, yet this was raised less frequently compared to female participants. Conversely, some male participants reported using a condom as per their partner’s request, even when their original intent was not to use one. Condom use abdication, or the willingness to abandon decisional power in a sexual encounter by allowing the partner to decide whether, and under what conditions, to engage in sexual activity (George, 2019), has been demonstrated to be a mediator of the relationship between acute alcohol intoxication and intentions to engage in condomless sex (Danube et al., 2016; George et al., 2016; Neilson et al., 2018, 2019; Staples et al., 2015). It has also been implicated in other tests of the dual-systems model as a potential mechanism by which affective arousal affects condom use intentions in male and female college students (Sheinfil & Woolf-King, 2021).

Overall, the results of the Qualitative Study demonstrated substantial overlap with the findings of the Quantitative Study, and highlighted partner risk perception and condom use abdication, as important constructs deserving consideration for inclusion in the combined theoretical model.

A Combined Model of Alcohol-Associated Condomless Sex

The results from Aim 1 and Aim 2 can be integrated to understand the ways in which individual-difference characteristics, alcohol consumption, and situation-specific conditions predict condom use during vaginal sexual activity in college students. Figure 6 depicts a conceptualized model of the relationships between these theory and evidence-based correlates and offers a preliminary integration of the qualitative and quantitative data from this study. The model combines constructs from the IMB, dual-systems, and alcohol myopia theories, and incorporates event-level elements from the psychosocial context in which college students engage in sexual activity. It also accounts for well-established between-person correlates of condom use such as history of condom use behavior and sexual sensation seeking. The model is predicated on the IMB model assumptions that knowledge of condoms and their effectiveness in preventing STIs and pregnancy is a prerequisite to condom use (Fisher et al., 1994). In addition, the degree to which one is motivated to prevent STI transmission influences condom use (Fisher et al., 1994). Simultaneously, as posited by the dual-systems model, competing interests presented by the reward-seeking system and its drive for novel and exciting experiences, in opposition with the ability of the self-regulation system to exert control over those impulses, differs from person to person (Shulman et al., 2016). Moreover, given that within the same individual, condom use can shift from event to event, the extent to which reward-seeking and self-regulation tendencies affect condom use motivation, varies as a function of specific elements of the sexual encounter (Simons et al., 2018).

Acute alcohol intoxication can weaken the self-regulation system (Simons et al., 2018) to the point that consideration for the potential of contracting an STI may be overlooked as attention more narrowly focuses on the potential benefits of engaging in sexual activity (e.g., physical pleasure; Steele & Josephs, 1990). Additionally, characteristics of the sexual relationship can also influence the degree to which one is motivated to use condoms (Cooper, 2010). For instance, the perceived likelihood of contracting an STI from a specific partner is influenced by the level of familiarity and comfort one feels within the sexual relationship (Macaluso et al., 2000). Additionally, college students describe that over time, with increasing levels of familiarity and comfort with a partner, consistent condom use decreases (Bolton et al., 2010). Therefore, even if a condom is typically used with a specific partner, while acutely intoxicated, the perceived risks of condomless sex with that same partner can be lowered to the point at which motivation to prevent STIs is inconsequential and a condom is not used.

Acute alcohol intoxication also increases an individual's willingness to abandon the decision to use a condom (George, 2019), a phenomenon that may be more pronounced in women (Danube et al., 2016; George et al., 2016; Neilson et al., 2018, 2019; Staples et al., 2015). This process can also be described through an alcohol myopia lens, such that while acutely intoxicated and facing pressure to not use a condom, individuals are more willing to let their partner make the final decision whether to use a condom (George et al., 2016). Consistent with college student accounts in the IDIs, it is posited that this process stems from anticipated negative reactions to insisting upon using a condom (George, 2019). As such, the combined model proposes condom use abdication as a mechanism by which alcohol intoxication promotes condomless sexual activity. Notably, this study was not designed to test mediation, however,

preliminary evidence suggests this is a worthwhile process to investigate in future work that can establish temporal sequencing between alcohol consumption, abstinence, and condom use.

The context in which the sexual encounter occurs plays an important role in the likelihood of using a condom. Specifically, when a condom is easily accessible, individuals are more likely to use one. Conversely, when no condom is present, the motivation to prevent STI transmission may not outweigh the desire to engage in sexual activity, especially while alcohol intoxication attenuates self-regulation processes. Relatedly, if an individual is not prepared, or planning to, engage in sexual activity, yet a potential sexual encounter progresses spontaneously (e.g., meeting a new partner at a party), a condom may not be used due to inaccessibility. There is also evidence that the reward-seeking system becomes activated in situations during which individuals are in the presence of their peers (Shulman et al., 2016; Steinberg, 2008), further reducing the likelihood of condom use after attending group social activities. This is in contrast to a one-on-one activity, such as a date or a pre-determined meetup for sex, where anticipation of engaging in sexual activity can be prepared for by having a condom accessible. This process also can be attributed to the self-regulation system being less well-developed in youth as compared to the reward-seeking system (Shulman et al., 2016), and thus playing a lesser role in condom use decision-making (Sheinfil & Woolf-King, 2021). Therefore, the confluence of acute alcohol intoxication, a compromised and under-developed self-regulation system, and psychosocial context, all interact to create a set of circumstances in which condom use motivation is sufficiently decreased to the point at which an individual's reward-seeking system exerts the strongest influence to engage in condomless sex. Consequently, the combined model proposes alcohol consumption, sexual partner type, and sexual context all function as moderators of the association between condom use motivation and condom use.

The model focuses on heterosexual sexual activity, rather than same-sex sexual activity because condom use is categorically different between the two sets of behaviors (Glick et al., 2012; Izazola-Licea et al., 2003), and is influenced by a different set of factors (Rhodes et al., 2007). Nevertheless, some core constructs identified as influencing condom use in the context of heterosexual sexual activity (e.g., condom use motivation) likely plays an important role in condom use in the context of same-sex sexual activity. Future research can consider using the combined model as a guide to investigate condomless sex in same-sex sexual activity.

Taken together, although an individual under typical circumstances may generally possess strong motivation to use condoms to prevent STI transmission, motivation can be attenuated by a variety of situation-specific factors, including alcohol intoxication, sexual relationship characteristics, and the context in which the sexual encounter takes place. This combined model offers a preliminary conceptualization for the confluence of factors that are associated with condom use in college students. Although the design of the present study was only able to identify potential pathways between some of the variables, future work can use this model as a guide to elucidate the nature of the moderating and mediating relationships.

Strengths

The current study advances the literature by constructing a model of alcohol-associated condomless sex in college students which can be further refined for use as the foundation of an alcohol-STI prevention intervention tailored for college students. The model is novel in its combination of popular health behavior theories that are largely investigated in isolation. In using a mixed-methods approach, the study successfully integrated quantitative findings from multilevel structural regression models with qualitative descriptions of college students' accounts of their substance use and sexual activity. This approach bolstered the accuracy of the constructs

included in the quantitative analyses, highlighted areas for refining the relationships between the constructs, and identified new variables omitted from the original theories. Mixed-methods also provided a useful framework for theory development (Guetterman et al., 2019) in striking a balance between parsimony and comprehensiveness to explain the complex phenomenon that is alcohol-associated condomless sex.

Another strength of this study was its event-level design. Measuring co-occurring substance use and sexual activity at multiple events over a prolonged duration of time (e.g., 90-day TLFB), facilitated statistical analyses that partitioned between-person tendencies from within-person fluctuations in both behaviors. The inferences that can be drawn from these multilevel analyses allow for an understanding of the relationship between the unique contribution of alcohol use on condom use, independent of individual-difference characteristics. Furthermore, there is an added layer of specificity in establishing the temporal sequencing of alcohol consumption preceding sexual activity than that offered by global association studies. Predicting condom use with precision has implications for developing interventions that can most effectively promote condom use in a high-risk population (Kazdin, 2014).

The study also offered a novel contribution to the literature exploring substance use and sexual activity in college students during the COVID-19 pandemic. Through assessing both sexual events that occurred prior to the onset of the pandemic, and after students returned to campus life, the degree to which patterns of substance use and sexual behavior are representative of those behaviors during pre-pandemic circumstances can be ascertained. There is thus a high degree of confidence in the applicability of the combined model constructed in this study to college students, despite data-collection spanning the time at which there were adjustments to campus-life under new pandemic-era circumstances and mitigation efforts.

Limitations and Directions for Future Research

The results of the study should be considered in the context of its limitations. First, the study was under-powered based on the estimates derived from *a priori* power-analyses by a considerable amount. This increased the likelihood of both Type I and Type II errors, especially considering the complexity of the multilevel models estimated. Although this was somewhat mitigated by the models fit to the TLFB data (due to the larger number of Level-1 observations), the accuracy of the estimates contained in the final models should nevertheless be considered preliminary. Furthermore, insufficient statistical power prohibited the ability to reliably test interaction terms between constructs from the various theories—substantially hindering the benefits of incorporating variables from multiple theoretical conceptualizations to test their potential synergetic effects. Future studies can aim to recruit a larger sample of college students and test the proposed combined model of alcohol-associated condomless sex with the specific intention of exploring potential interactions among the various constructs. Specifically, estimating cross-level interactions between condom use motivation and situation-specific within-person predictors of condom use, such as acute alcohol intoxication, sexual partner characteristics, and sexual encounter context, can explicate the role of this between-person factor that may function as an important moderator.

Second, the study relied on retrospective reporting of substance use and sexual activity, which is subject to recall bias and misreporting (Schroder et al., 2003). Although the TLFB has demonstrated strong reliability for extended recall periods (Napper et al., 2010), underreporting may occur as duration increases to 12-months (Weinhardt et al., 1998). To minimize the potential for inaccurate reporting, the TLFB was interviewer-administered and participants utilized memory enhancements such as time-stamped photographs, text-messages, and social

media posts. Future studies can address these limitations by collecting data prospectively with large samples, using validated instruments that maximize the accuracy of self-reports and decrease the likelihood of committing Type I and Type II errors.

Last, the majority of participants were recruited from a single private university in the northeastern United States. Recruitment efforts attempted to enroll participants from wider geographic regions to increase the generalizability of the findings to college students across the country, yet these sources of participants were fraught with low-quality data. Only one participant who did not attend Syracuse University enrolled in Session 2, and all participants who completed IDIs were Syracuse University students. Future research can aim to recruit a diverse sample of college students from across various geographic regions to maximize the applicability of the combined model to college students broadly.

Clinical Implications

The ultimate goal of this line of clinical health research is to reduce alcohol-associated condomless sex in college students. To this end, the combined model in Figure 6 can be used to inform the development of an alcohol-STI prevention intervention. Individual-difference characteristics such as sensation seeking consistently demonstrate strong associations with alcohol consumption and condomless sex, however, given that it is a stable trait, it is not an ideal intervention target. Alternatively, the effectiveness of behavioral interventions can be maximized when designed to address more malleable correlates of alcohol-associated condomless sex, such as condom use motivation. One potential application of an intervention designed to enhance intrinsic motivation is illustrated by Monti et al. (2016), in which a brief-motivational interviewing (MI) intervention was designed to reduce alcohol consumption, condomless sexual activity with casual partners, and sexual activity while intoxicated. The results of the RCT

evaluating the efficacy of this single-session MI intervention (M duration = 63.11 minutes; SD = 20.76) demonstrated promising results (Monti et al., 2016). Compared to a brief advice control condition, participants assigned to the MI condition reported significantly fewer average number standard drinks consumed per week ($d = -0.17$), fewer heavy drinking days ($IRR = 0.79$), fewer instances of condomless sex with casual partners ($OR = 0.59$), and fewer occasions of engaging in sexual activity while intoxicated ($IRR = 0.73$). These effects largely persisted throughout the 9-month follow-up period. Although the age of participants enrolled in this RCT ranged from 18–60, and the majority were not college students, the long-lasting effects indicate this type of intervention as a promising candidate to be adapted for college students.

Interventions containing elements of MI that have been tested with college student samples have not demonstrated success in reducing alcohol-associated condomless sex (e.g., Dermen & Thomas, 2011). Nevertheless, the intervention designed by Monti et al. (2016) highlights areas for which such intervention efforts can be improved. The MI intervention contained personalized normative feedback related to alcohol consumption, open-ended questions about pros/cons of alcohol consumption and condomless sexual activity, and a discussion of goals for behavior change and strategies to navigate potential obstacles. The intervention was intentionally designed to facilitate an “integrated discussion about alcohol use and sex” (Celio et al., 2019, pg. 358), during which there was a specific emphasis on engaging in sexual activity while experiencing acute alcohol intoxication. This approach contrasts with the majority of interventions designed for college students that use a combined alcohol and STI-risk reduction approach, in which both foci are addressed independently. It also offers a potential explanation for the shortcomings of existing interventions (Kilwein et al., 2017), and underlines the importance of tailoring

interventions to college students, for whom the psychosocial context is characterized by the frequent co-occurrence of alcohol consumption and sexual activity.

The intervention designed by Monti et al. (2016), in combination with the theoretical framework depicted in Figure 6, can serve as the basis of a behavioral intervention to reduce college student alcohol-associated condomless sex. The primary component of the intervention could be a single MI session consisting of an explicit discussion surrounding condom use while acutely intoxicated. Additionally, the session can incorporate the following educational elements: personalized normative feedback about STI prevalence on college campuses (including STI transmission rates among regular sex partners), increased likelihood of condomless sex in conjunction with above-average alcohol consumption, and the risk of condomless sex following a group social event (e.g., frat party). The intervention could also implement condom use reminder cues (Kilwein et al., 2017) by leveraging automated notifications sent to students' mobile devices based on their patterns of drinking behavior. For instance, on days of the week during which a student reported typically consuming alcohol, they can be sent a text-message reminder about the increased risk of condomless sex following above-average drinking. Further, the message can ask for a response to a prompt about whether the student currently has condoms accessible, and if not, provide information about where condoms can be easily obtained (e.g., campus health resource center). While this type of behavioral intervention is individual-focused, the combined model proposed in this study also suggests approaches that alter the broader psychosocial environment of college campuses can be a useful intervention target.

The model derived from the present study further highlights the benefits of structural interventions that provide college students free and easy access to condoms, such as through condom distribution programming (Eastman-Mueller et al., 2016; Francis et al., 2016).

Nonetheless, as few as 45% of college campuses report providing free condoms to students (Habel et al., 2018). Extensions of this type of structural intervention can take the form of free STI testing services. One example of this type of preventative service is in the form of testing events (e.g., *Get Yourself Tested*; Habel et al., 2015) which can be advertised to all students, regardless of suspected STI-status. Moreover, testing events offer an opportunity to deliver information about alcohol consumption and sexual activity by incorporating education materials that can be provided to individuals with regular and/or casual sex partners about ways to facilitate discussion about STI status and condom use practices. This may be especially relevant for college students because very few reported relying on objective indicators of their partner's STI status (e.g., recent STI test results) to inform their condom use behavior. Additionally, screening for hazardous alcohol consumption can be easily implemented during STI-testing events to identify individuals who may benefit from individualized behavioral intervention. Overall, a mixture of individual behavioral interventions targeting increasing motivation to consistently use condoms while simultaneously reducing hazardous alcohol consumption, in combination with structural support for accurate STI diagnosis and condom accessibility on college campuses, has the greatest likelihood of promoting college students' health.

Conclusion

The present study used a mixed-methods approach to construct a preliminary model of college student alcohol-associated condomless sex. The results demonstrated that both between- and within-person constructs from popular health behavior theories can be combined to predict condomless sexual activity. Findings from this study offer directions for future research to refine the combined model constructed here to gather support for its utility as the theoretical foundation for a combination alcohol-STI prevention intervention tailored for college students.

Table 1

Summary of Modifications to the Original Study Design and Methodology due to the COVID-19 Pandemic

Methodological Modification	Rationale	Committee Approval
Implemented remote data-collection procedures: Session 1 electronic survey; Session 2 Zoom videoconference	Adherence to Syracuse University humans-subject research policies.	April 1, 2020
Amended eligibility criteria to recruit students from colleges/universities located across all geographic regions of the United States	Minimize effects of heterogenous mitigation efforts localized to unique geographic location.	June 12, 2020
Added COVID-19 self-report questionnaires (e.g., Pandemic Stress Index) to Session 1 electronic survey	Measure changes to participant daily life resulting from COVID-19 pandemic.	June 12, 2020
Added three most-recent sexual event assessment to Session 1 electronic survey	Collect data that allowed for a comparison between alcohol-associated condomless sex pre- and post-COVID-19 pandemic mitigation efforts.	June 12, 2020
Revised Aim 2 (Qualitative Study) from conducting Focus Groups to elicit feedback about model constructed in Aim 1, to conducting in-depth-interviews to gather perceptions of condom use decision-making	Results of Aim 1 (Quantitative Study) indicated analyses were likely under-powered and eliciting feedback about the preliminary model was premature. Qualitative interviews allowed for a mixed-methods approach to construct the combined model.	July 22, 2021

Note: Data-collection for the original laboratory study was initiated on February 21, 2020. As per Syracuse University directives, the original laboratory study was discontinued on March 20, 2020. All modifications were approved by the Dissertation Proposal Committee and the Syracuse University Institutional Review Board prior to implementation. Data-collection after the modification approvals resumed on July 11, 2020 and was completed on December 9, 2021.

Table 2
Participant Demographic Characteristics by Recruitment Source

	Total	SONA	M-Turk	Other	<i>p</i> -value
	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	
Gender					.09 (χ^2)
Male	51 (39.84)	31 (34.07)	17 (56.67)	3 (42.86)	
Female	77 (60.16)	60 (65.93)	13 (43.33)	4 (57.14)	
Class Standing					<.001 (χ^2)
Freshman	64 (50.00)	63 (69.23)	0 (0.00)	1 (14.29)	
Sophomore	22 (17.19)	15 (16.48)	5 (16.67)	2 (28.57)	
Junior	19 (14.84)	10 (10.99)	9 (30.00)	0 (0.00)	
Senior	23 (17.97)	3 (3.30)	16 (53.33)	4 (57.14)	
Race					.39 (χ^2)
White	89 (69.53)	64 (70.33)	21 (70.00)	4 (57.14)	
American Indian /Alaska Native	1 (0.78)	0 (0.00)	1 (3.33)	0 (0.00)	
Black/African- American	10 (7.81)	4 (4.40)	5 (16.67)	1 (14.29)	
Mixed Race	9 (7.03)	7 (7.70)	2 (6.66)	1 (14.29)	
Asian/Pacific Islander	15 (11.72)	13 (14.29)	1 (3.33)	1 (14.29)	
Decline to State	3 (2.34)	3 (3.30)	0 (0.00)	0 (0.00)	
Ethnicity					.97 (χ^2)
Hispanic/Latinx	19 (14.84)	14 (15.38)	4 (13.33)	7 (100.00)	
STI Diagnosis	34 (26.56)	9 (9.90)	22 (73.33)	3 (42.86)	<.001
COVID-19 Positive	17 (13.28)	15 (16.48)	0 (00.00)	2 (28.57)	.03
COVID-19 QoL					.74
Increase	5 (3.91)	3 (3.30)	2 (6.66)	0 (0.00)	
No Change	13 (9.38)	10 (10.99)	3 (10.00)	0 (0.00)	
Decrease	110 (85.94)	78 (85.71)	25 (83.34)	7 (100.00)	
COVID-19 Alcohol Use					.01
Increase	67 (52.34)	45 (49.45)	17 (56.67)	1 (14.29)	
No Change	45 (35.16)	37 (40.66)	7 (23.33)	1 (14.29)	
Decrease	16 (12.5)	9 (9.90)	6 (20.00)	5 (71.43)	
COVID-19 Condom Use					<.001
Increase	12 (9.38)	5 (5.50)	5 (16.67)	2 (28.57)	
No Change	99 (77.34)	82 (90.10)	13 (43.33)	4 (57.14)	
Decrease	17 (13.28)	4 (4.40)	12 (40.00)	1 (14.29)	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>p</i> -value
Age (years)	19.95 (2.23)	18.89 (1.19)	22.70 (1.95)	22.57 (2.29)	<.001
Sex partners past 3-months	2.55 (1.99)	2.16 (1.64)	3.03 (2.66)	3.71 (1.70)	.03
Sex partners past-year	4.87 (4.77)	4.51 (4.78)	5.50 (5.32)	7.00 (6.06)	.08

Note: Total *N* = 128, SONA *n* = 91, M-Turk *n* = 30, Other *n* = 7; STI Diagnosis = Lifetime Positive Sexually Transmitted Infection Diagnosis; COVID-19 Positive = Lifetime Positive COVID-19 Diagnosis; COVID-19 QoL = Quality of Life during COVID-19; *M* = Mean, *SD* = Standard Deviation.

Table 3
Bivariate Correlations among Between-Person Variables

	<i>r</i>													
	<i>M</i>	<i>(SD)</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Gender	–	–	–											
2. Age	19.95	2.23	-.17	–										
3. Baseline Condom Use	3.26	1.03	-.12	.01	–									
4. STI Knowledge	19.38	2.76	.13	-.01	-.11	–								
5. Condom Use Motivation	49.63	12.46	-.09	-.01	.67***	-.28**	–							
6. CISQ	125.07	19.77	-.11	-.07	-.50***	.29**	-.63***	–						
7. Sexual Sensation Seeking	124.14	38.44	-.24*	.20*	-.20*	.08	-.29**	.33***	–					
8. UPPS-P	140.25	21.14	.08	-.01	.08	-.06	-.01	-.13	.17	–				
9. SRAE	49.63	12.46	.05	.07	-.10	.13	-.27**	.19*	.47***	.32**	–			
10. Future Orientation	40.72	4.52	.14	-.25**	-.26**	.05	-.07	.16	-.02	-.40***	-.13	–		
11. BART	6.88	3.23	-.14	.04	-.24	.28	-.27	.13	.28*	-.01	.21	.21	–	
12. ToL	3.58	0.96	.05	.13	.01	.19	-.10	.02	-.01	-.17	-.08	-.02	-.10	–

Note. *r* = Pearson product-moment (continuous variables), Spearman's rho (categorical/ordinal variables), *M* = Mean, *SD* = Standard Deviation. CISQ = Condom Use Influence Strategy Questionnaire, UPPS-P = Urgency, Premeditation, Perseverance, Sensation Seeking, Positive Urgency, Impulsive Behavior Scale, SRAE = Sex-Related Alcohol Expectancies, BART = Balloon Analog Risk Task, ToL = Tower of London.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Characteristics of 90-Day Timeline Followback Sexual and Substance Use Events

	<i>N</i>	Percentage (%)
Total Sexual Events	756	–
Oral Intercourse	621	82.14
Condom	5	0.81
No Condom	616	99.19
Vaginal Intercourse	669	88.49
Condom	270	40.56
No Condom	399	59.64
Anal Intercourse	4	0.53
Condom	1	25.00
No Condom	3	75.00
Partner type		
Regular	443	58.60
Casual	192	25.40
New	121	16.01
Partner STI Status		
Negative	498	65.87
Unknown	258	34.13
Context		
Social Event (e.g., Frat Party)	214	28.21
One-on-One Encounter (e.g., Date)	542	71.69
	<i>N</i>	Percentage (%)
Substance Use Days	1,656	–
Alcohol	1,273	76.87
Other (e.g., Cannabis)	745	44.99
Alcohol + Other	362	21.86
Alcohol + Vaginal Intercourse	246	14.86
Condom	133	54.07
No Condom	113	45.93

Note. Total $N = 57$ sexually-active college student drinkers. Average number of standard drinks consumed = 3.23 ($SD = 4.47$), average number of standard drinks consumed per drinking day = 5.91 ($SD = 4.47$).

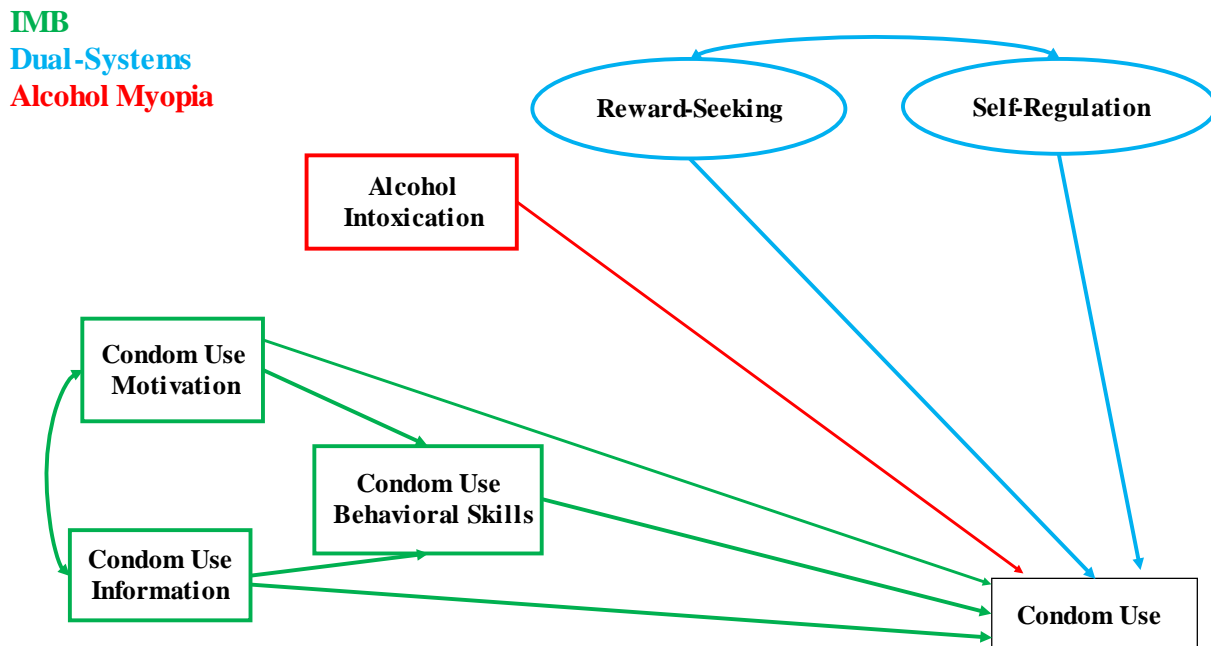
Table 5
Characteristics of Three Most-Recent Sexual Events Prior to COVID-19

	<i>N</i>	Percentage (%)
Total Sexual Events	348	–
Oral Intercourse	208	59.77
Condom	41	19.71
No Condom	167	80.29
Vaginal Intercourse	318	91.38
Condom	181	56.92
No Condom	137	43.08
Anal Intercourse	36	10.34
Condom	21	58.33
No Condom	15	41.67
Partner type		
Regular	141	40.52
Casual	85	24.43
New	122	35.06
Context		
Social Event (e.g., Frat Party)	94	27.01
One-on-One Encounter (e.g., Date)	254	72.99
	<i>N</i>	Percentage (%)
Substance Use	340	–
Alcohol	204	60.00
Other (e.g., Cannabis)	71	20.88
Alcohol + Other	65	19.12
Alcohol + Vaginal Intercourse	184	54.12
Condom	105	57.07
No Condom	79	42.93

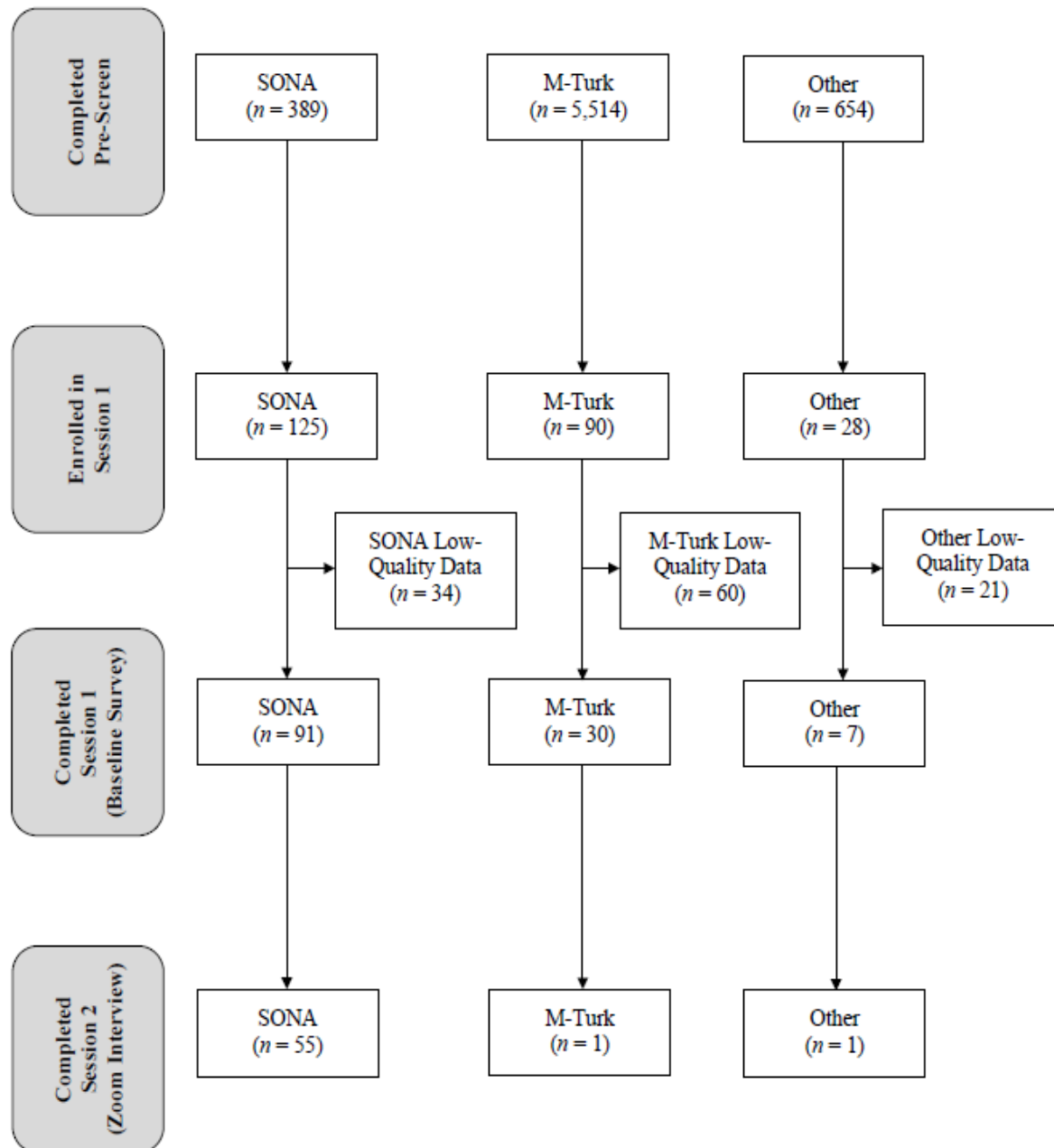
Note. Total *N* = 128 sexually-active college student drinkers. Average number of standard drinks consumed = 2.52 (*SD* = 3.78)

Figure 1

Conceptual Model of College Student Alcohol-Associated Condomless Sex



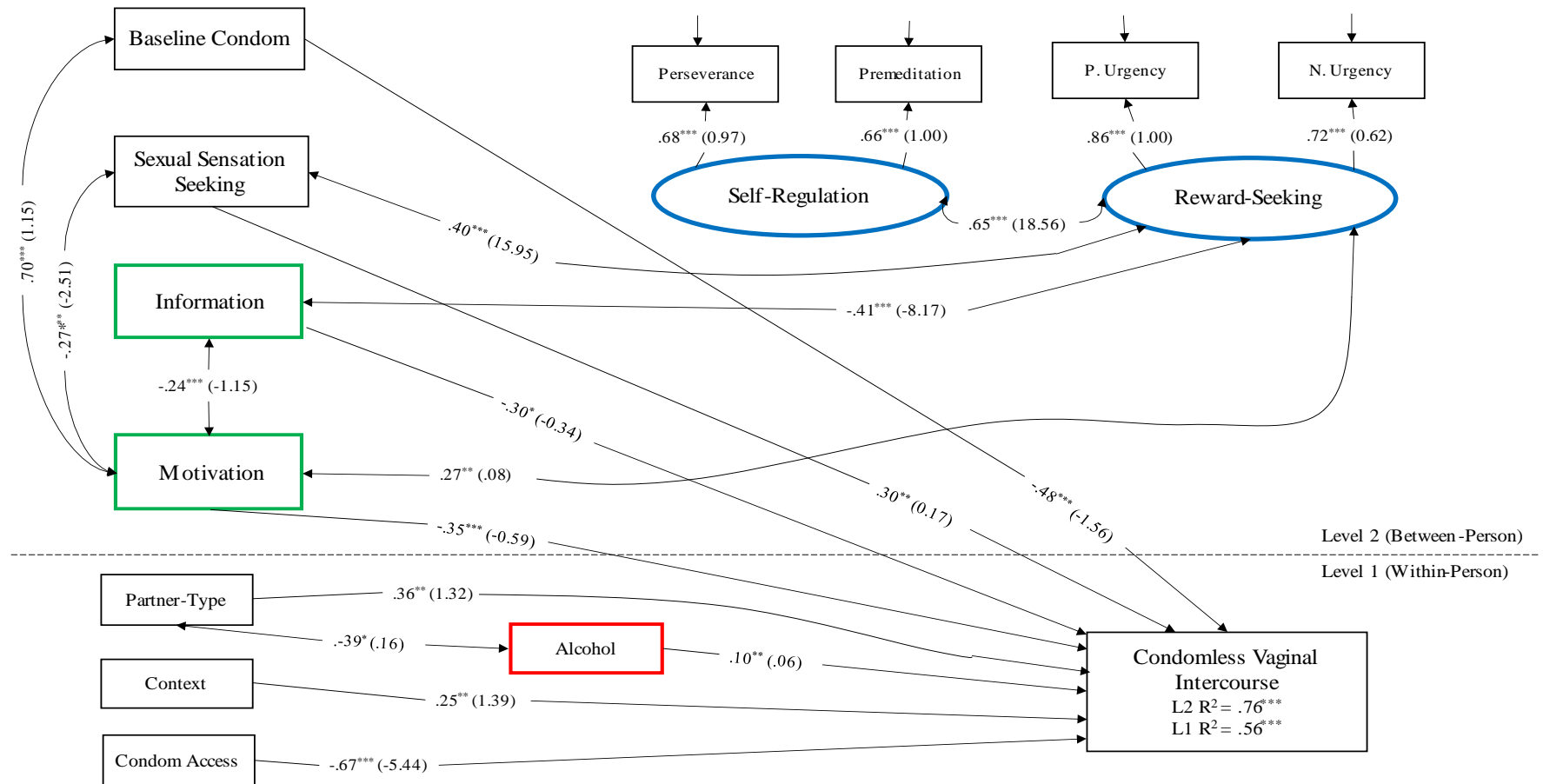
Note. IMB = Information-Motivation-Behavioral Skills Model.

Figure 2*Quantitative Aim 1 Participant Enrollment Flow Diagram*

Note. Session 1 Total $N = 128$; Session 2 Total $N = 57$. SONA = Research Participation Pool, M-Turk = Amazon Mechanical Turk, Other = Social media, flyers, etc.

Figure 3

90-Day Timeline Followback Trimmed Structural Regression Model of Condomless Vaginal Intercourse

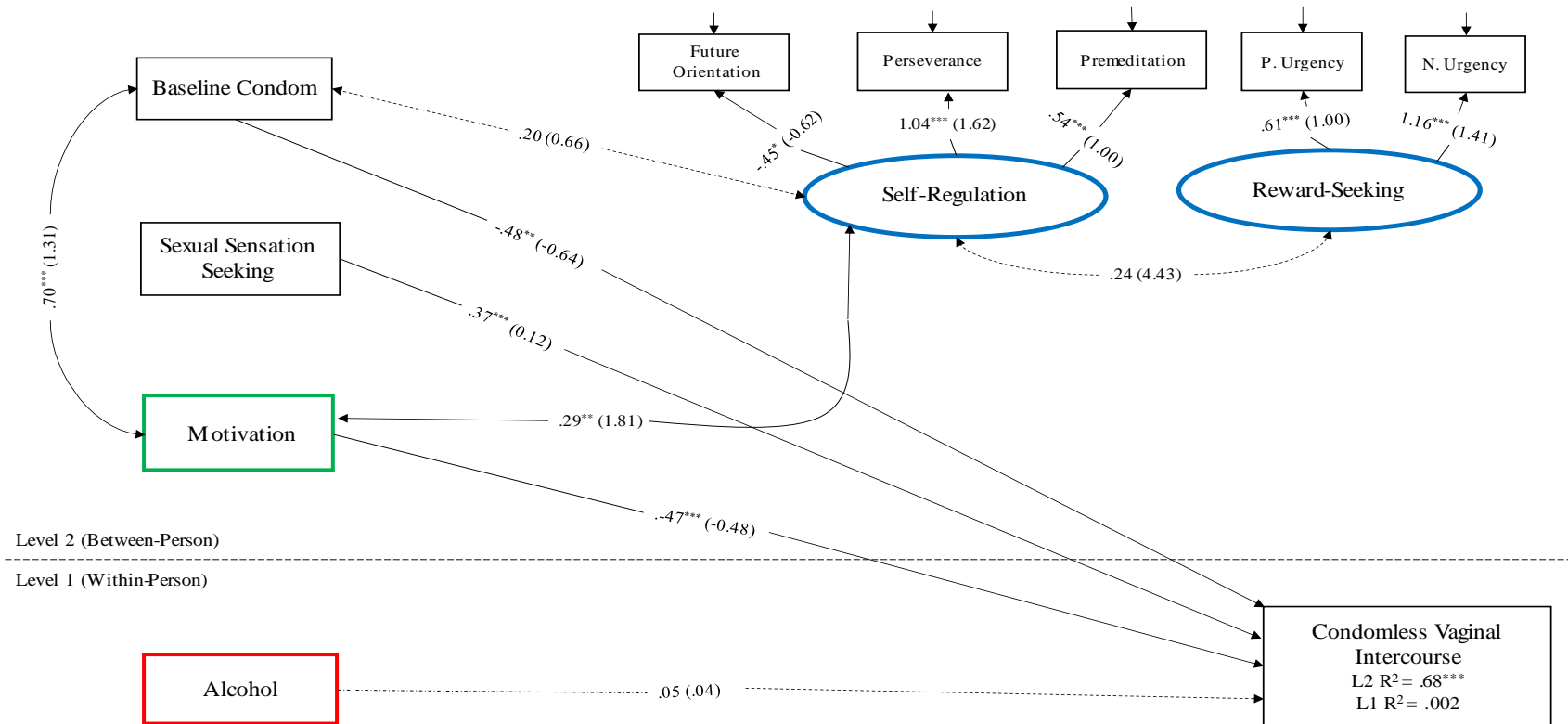


Note. Total $N = 57$ sexually-active college student drinkers ($n = 701$ vaginal sex events). Standardized estimates (and unstandardized estimates) are presented. ($\chi^2(36,56) = 4798.21, p < .001$; Akaike Information Criterion (AIC) = 2719.41, Bayesian Information Criterion (BIC) = 2883.19, sample-size adjusted BIC = 2768.89).

* $p < .05$ ** $p < .01$ *** $p < .001$.

Figure 4

Most-Recent Sexual Events Prior to COVID-19 Trimmed Multilevel Structural Regression Model of Condomless Vaginal Intercourse

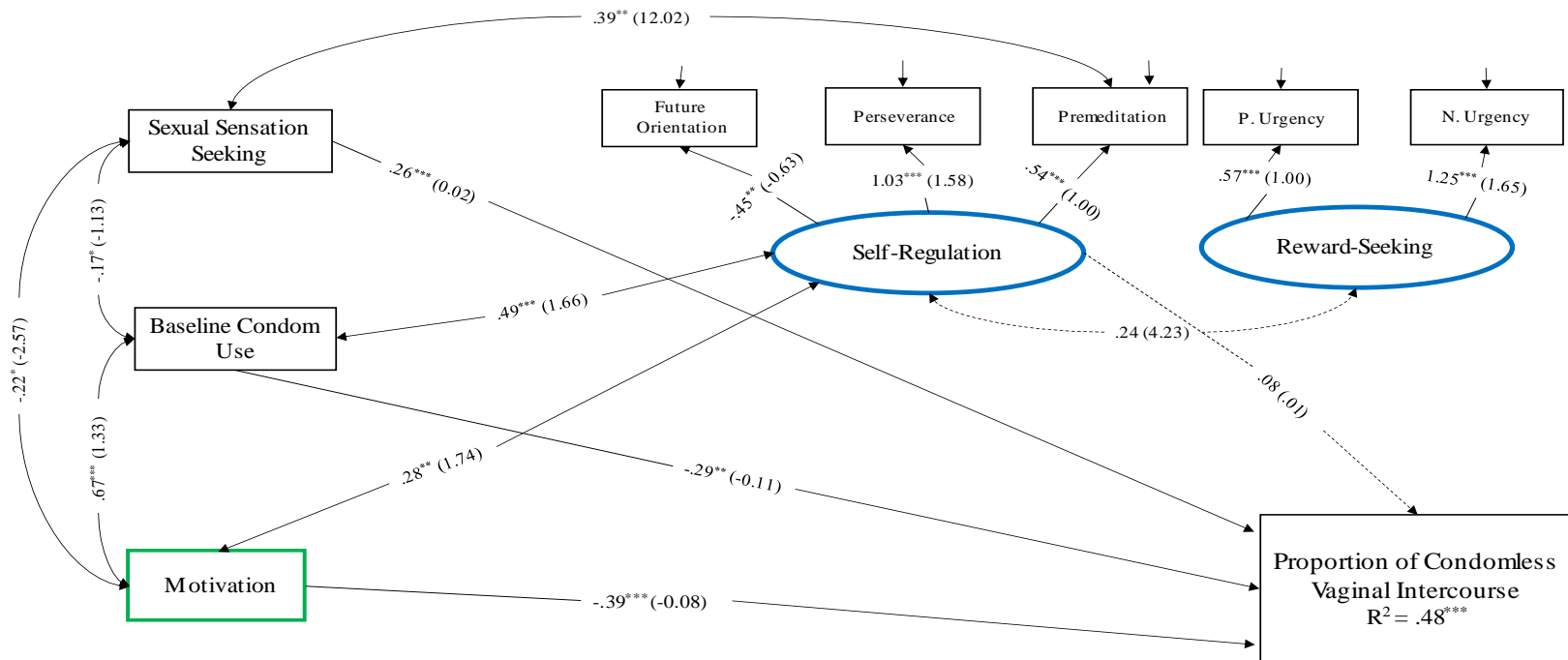


Note. Total $N = 128$ sexually-active college student drinkers ($n = 348$ sex events). Standardized estimates (and unstandardized estimates) are presented. Solid lines indicate significant relationships at $p < .05$, and dashed lines indicate non-significant relationships. ($\chi^2(73,111) = 2161.37, p < .001$; Akaike Information Criterion (AIC) = 4771.99, Bayesian Information Criterion (BIC) = 4902.97, sample-size adjusted BIC = 4795.11)

* $p < .05$ ** $p < .01$ *** $p < .001$.

Figure 5

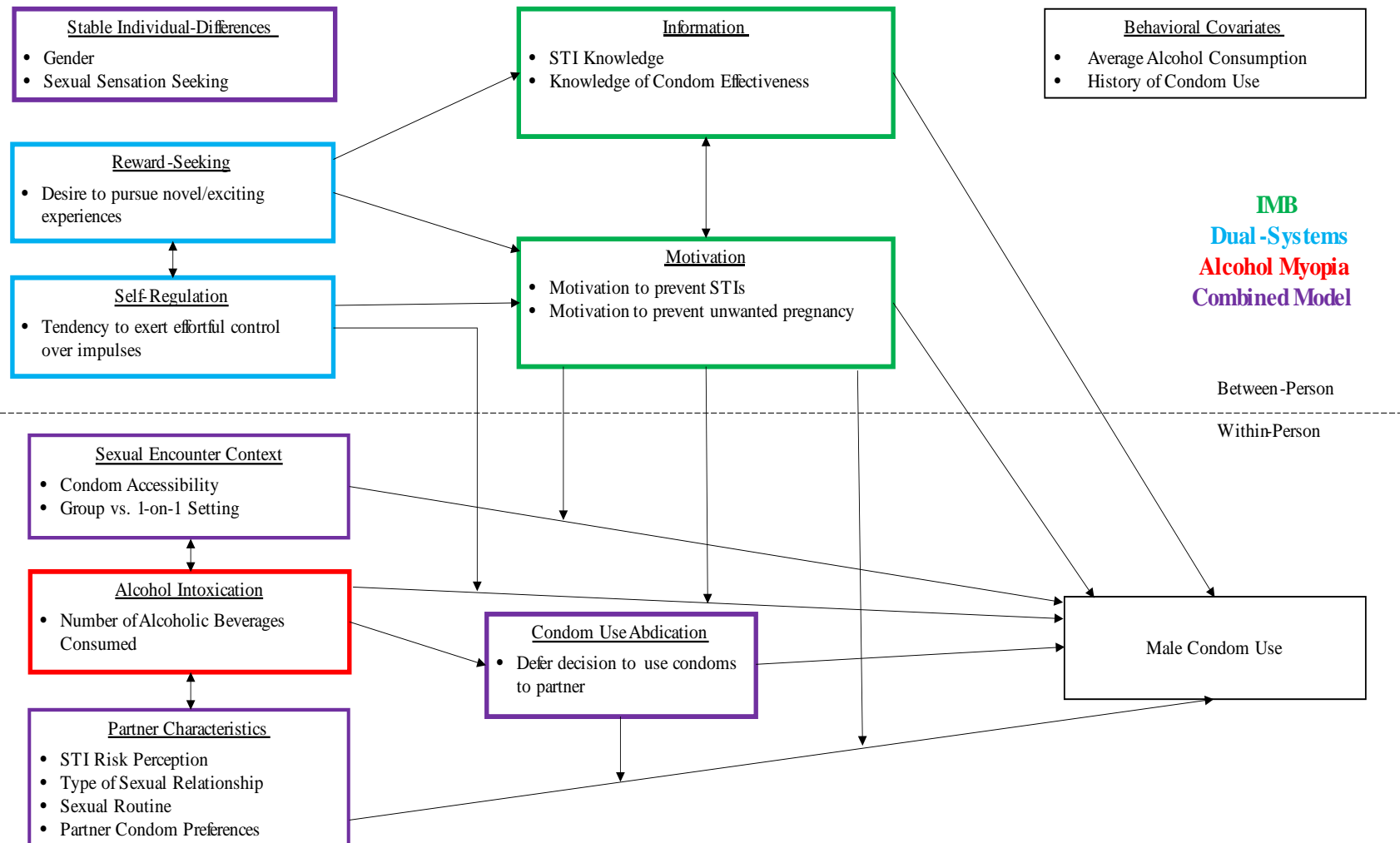
Most-Recent Sexual Events Prior to COVID-19 Trimmed Structural Regression Model of Condomless Virginal Intercourse



Note. Total $N = 128$ sexually-active college student drinkers ($n = 348$ sex events). Standardized estimates (and unstandardized estimates) are presented. Solid lines indicate significant relationships at $p < .05$, and dashed lines indicate non-significant relationships. ($\chi^2(26) = 28.14, p = .35$, Root Mean Square Error of Approximation = .02, 90% Confidence Interval [.00, .04], Comparative Fit Index = .99, Tucker Lewis Index = .98, Standardized Root Mean Square Residual = .07, Akaike Information Criterion (AIC) = 14766.93, Bayesian Information Criterion (BIC) = 14912.62, sample-size adjusted BIC = 14795.23). * $p < .05$ ** $p < .01$ *** $p < .001$.

Figure 6

Combined Model of College Student Alcohol-Associated Condomless Sex



Note. IMB = Information-Motivation-Behavioral Skills Model, Combined Model = unique constructs identified in this study.

Appendix

Appendix A. Saturated 90-Day Timeline Followback Multilevel Structural Regression Model

Estimates

Appendix B. Saturated Three Most-Recent Sexual Events Multilevel Structural Regression

Model Estimates

Appendix C. Session 1 REDCap Electronic Survey

Appendix D. Session 2 Timeline Followback Example

Appendix E. Qualitative In-Depth-Interview Guide

Appendix A.

Saturated 90-Day Timeline Followback Multilevel Structural Regression Model Estimates

Level-2 Pathway	<i>b</i>	<i>S.E.</i>	β	95% CI	<i>p</i> -value
Gender \leftrightarrow Sex-Expectancies	1.01	3.09	0.04	[-0.20, 0.27]	.75
Gender \leftrightarrow Sexual Sensation Seeking	-1.93	1.51	-0.16	[-0.42, 0.09]	.21
Gender \leftrightarrow Condom Information	0.21	0.70	0.04	[-0.20, 0.28]	.77
Gender \leftrightarrow Condom Motivation	-0.03	0.37	-0.01	[-0.18, 0.16]	.95
Gender \leftrightarrow Condom Behavioral Skills	-29.02	8.78	-0.34	[-0.53, -0.15]	<.001
Gender \leftrightarrow Self-Regulation	-0.23	1.69	-0.03	[-0.55, 0.48]	.90
Gender \leftrightarrow Reward-Seeking	2.19	3.52	0.13	[-0.26, 0.52]	.52
Baseline Condom Use \leftrightarrow Sex-Expectancies	-1.31	1.14	-0.12	[-0.32, 0.08]	.24
Baseline Condom Use \leftrightarrow Sexual Sensation Seeking	-1.37	0.62	-0.28	[-0.50, -0.06]	.01
Baseline Condom Use \leftrightarrow Between-Person Alcohol	0.24	0.21	0.13	[-0.07, 0.34]	.20
Baseline Condom Use \leftrightarrow Condom Information	-0.43	0.32	-0.18	[-0.42, 0.06]	.15
Baseline Condom Use \leftrightarrow Condom Motivation	1.33	0.20	0.75	[0.62, 0.87]	<.001
Baseline Condom Use \leftrightarrow Condom Behavioral Skills	-19.19	3.88	-0.57	[-0.71, -0.42]	<.001
Baseline Condom Use \leftrightarrow Self-Regulation	0.21	0.68	-0.14	[-0.30, 0.44]	.71
Baseline Condom Use \leftrightarrow Reward-Seeking	-0.03	1.20	-0.004	[-0.33, 0.32]	.98
Sex-Expectancies \leftrightarrow Sexual Sensation Seeking	27.12	9.35	0.44	[0.24, 0.64]	.10
Sex-Expectancies \leftrightarrow Between-Person Alcohol	-2.57	2.24	-0.11	[-0.32, 0.39]	.29
Sex-Expectancies \leftrightarrow Condom Information	-0.23	3.47	-0.01	[-0.23, 0.21]	.95
Sex-Expectancies \leftrightarrow Condom Motivation	-6.80	3.11	-0.30	[-0.53, -0.07]	.01
Sex-Expectancies \leftrightarrow Condom Behavioral Skills	79.87	51.35	0.19	[-0.03, 0.40]	.09
Sex-Expectancies \leftrightarrow Self-Regulation	1.79	12.32	0.05	[-0.55, 0.65]	.87
Sex-Expectancies \leftrightarrow Reward-Seeking	39.02	14.61	0.43	[0.20, 0.66]	<.001
Sexual Sensation Seeking \leftrightarrow Between-Person Alcohol	0.70	1.47	0.07	[-0.20, 0.34]	.62
Sexual Sensation Seeking \leftrightarrow Condom Information	1.31	1.80	0.10	[-0.16, 0.35]	.47
Sexual Sensation Seeking \leftrightarrow Condom Motivation	-4.74	1.46	-0.47	[-0.68, -0.26]	<.001
Sexual Sensation Seeking \leftrightarrow Condom Behavioral Skills	39.49	29.21	0.21	[-0.11, 0.52]	.20
Sexual Sensation Seeking \leftrightarrow Self-Regulation	-0.60	4.06	-0.04	[-0.56, 0.49]	.89
Sexual Sensation Seeking \leftrightarrow Reward-Seeking	17.55	7.28	0.43	[0.18, 0.69]	.001
Between-Person Alcohol \leftrightarrow Condom Information	-0.29	0.58	-0.06	[-0.28, 0.17]	.63

Level-2 Pathway	<i>b</i>	<i>S.E.</i>	β	95% CI	<i>p</i> -value	
Between-Person Alcohol \leftrightarrow Condom Motivation	-0.001	0.49	0.00	[-0.26, 0.25]	.99	
Between-Person Alcohol \leftrightarrow Condom Behavioral-Skills	9.36	10.20	0.13	[-0.12, 0.39]	.31	
Between-Person Alcohol \leftrightarrow Self-Regulation	-1.45	1.08	-0.24	[-0.57, 0.10]	.16	
Between-Person Alcohol \leftrightarrow Reward-Seeking	0.20	2.14	0.01	[-0.26, 0.29]	.93	
Condom Information \leftrightarrow Condom Motivation	-1.72	0.75	-0.34	[-0.56, -0.12]	.002	
Condom Information \leftrightarrow Condom Behavioral Skills	28.93	14.75	0.30	[0.05, 0.56]	.02	
Condom Information \leftrightarrow Self-Regulation	-1.15	1.47	-0.14	[-0.51, 0.23]	.47	
Condom Information \leftrightarrow Reward-Seeking	-8.00	3.61	-0.40	[-0.66, -0.14]	.003	
Condom Motivation \leftrightarrow Condom Behavioral Skills	-46.23	8.51	-0.66	[-0.79, -0.53]	<.001	
Condom Motivation \leftrightarrow Self-Regulation	0.78	1.06	0.13	[-0.27, 0.52]	.53	
Condom Motivation \leftrightarrow Reward-Seeking	-0.76	2.47	-0.05	[-0.38, 0.28]	.76	
Condom Behavioral Skills \leftrightarrow Self-Regulation	-8.26	16.96	-0.07	[-0.35, 0.20]	.61	
Condom Behavioral Skills \leftrightarrow Reward-Seeking	-13.24	46.88	-0.05	[-0.37, 0.28]	.77	
Self-Regulation \leftrightarrow Reward-Seeking	15.09	15.79	0.62	[0.14, 1.11]	.01	
Gender \rightarrow CVI	-10.52	11.96	-1.46	[-4.78, 1.87]	.39	
Baseline Condom Use \rightarrow CVI	-1.17	7.38	-0.33	[-4.46, 3.79]	.88	
Sex-Expectancies \rightarrow CVI	-0.59	0.67	-2.12	[-6.69, 2.45]	.36	
Sexual Sensation Seeking \rightarrow CVI	-1.68	1.58	-2.75	[-7.85, 2.36]	.29	
Between-Person Alcohol \rightarrow CVI	-2.21	2.96	-1.33	[-4.81, 2.15]	.45	
Condom Information \rightarrow CVI	2.99	2.53	2.40	[-1.82, 6.62]	.27	
Condom Motivation \rightarrow CVI	0.08	5.45	0.05	[-6.26, 6.35]	.99	
Condom Behavioral Skills \rightarrow CVI	0.07	0.15	0.77	[-2.68, 4.22]	.66	
Self-Regulation \rightarrow CVI	-6.83	12.70	-6.62	[-20.19, 6.95]	.34	
Reward-Seeking \rightarrow CVI	6.31	2.35	15.01	[0.05, 29.97]	.05	
Level-1 Pathway	<i>b</i>	<i>S.E.</i>	β	aOR	95% CI	<i>p</i> -value
Number of Standard Drinks \rightarrow CVI	0.04	0.02	0.07	1.05	[1.00, 1.09]	.04
Other Substance Use \rightarrow CVI	1.02	0.61	0.17	2.77	[0.85, 9.05]	.08
Sexual Partner Type \rightarrow CVI	1.40	0.71	0.36	4.07	[1.01, 16.44]	.01
Sexual Encounter Context \rightarrow CVI	1.56	0.52	0.27	4.73	[1.70, 13.18]	<.001
Condom Accessibility \rightarrow CVI	-5.93	1.39	-0.69	0.003	[0.00, 0.04]	<.001

Note. Total $N = 58$ College Student Drinkers ($n = 701$ vaginal sex events). AIC = 38075.73, BIC = 38548.89, sa-BIC = 38218.67. Level-2 predictors are sample-centered, Level-1 predictors are person-centered. Sex-Expectancies = Alcohol-Related Sex Expectancies; Between-Person Alcohol = sample-centered average number of standard drinks per drinking day. Significant pathways at $p < .05$ are in **bold**. b = unstandardized coefficient, $S.E.$ = standard error, β = standardized coefficient, aOR = adjusted Odds Ratio, 95% CI = 95% confidence interval.

Appendix B.

Saturated Three Most-Recent Sexual Events Multilevel Structural Regression Model Estimates

Level-2 Pathway	<i>b</i>	<i>S.E.</i>	β	95% CI	<i>p</i> -value
Recruitment Source \leftrightarrow Gender	-0.16	0.08	-0.19	[-0.38, 0.002]	.05
Recruitment Source \leftrightarrow Baseline Condom Use	0.13	0.16	0.07	[-0.10, 0.25]	.42
Recruitment Source \leftrightarrow Sex-Expectancies	4.20	1.98	0.19	[0.04, .34]	.02
Recruitment Source \leftrightarrow Sexual Sensation Seeking	2.68	0.92	0.24	[0.10, 0.39]	.001
Recruitment Source \leftrightarrow Between-Person Alcohol	1.30	0.75	0.18	[0.05, 0.30]	.01
Recruitment Source \leftrightarrow Condom Information	-0.21	0.53	-0.04	[-0.25, 0.17]	.69
Recruitment Source \leftrightarrow Condom Motivation	0.12	0.33	0.04	[-0.16, 0.23]	.72
Recruitment Source \leftrightarrow Condom Behavioral Skills	-7.41	6.63	-0.11	[-0.30, 0.09]	.27
Recruitment Source \leftrightarrow Self-Regulation	-8.77	3.84	-0.84	[-0.98, -0.70]	<.001
Recruitment Source \leftrightarrow Reward-Seeking	-7.75	3.14	-0.55	[-0.80, -0.30]	<.001
Gender \leftrightarrow Baseline Condom Use	-0.03	0.05	-0.06	[-0.23, 0.12]	.54
Gender \leftrightarrow Sex-Expectancies	0.51	0.59	0.08	[-0.10, 0.28]	.37
Gender \leftrightarrow Sexual Sensation Seeking	-0.51	0.29	-0.17	[-0.36, 0.02]	.08
Gender \leftrightarrow Condom Information	0.15	0.14	0.11	[-0.08, 0.29]	.28
Gender \leftrightarrow Condom Motivation	-0.02	0.09	-0.02	[-0.22, 0.17]	.81
Gender \leftrightarrow Condom Behavioral Skills	-2.77	1.85	-0.14	[-0.39, 0.04]	.13
Gender \leftrightarrow Self-Regulation	0.13	0.15	0.08	[-0.12, 0.28]	.44
Gender \leftrightarrow Reward-Seeking	0.62	0.33	.19	[-0.01, 0.38]	.06
Baseline Condom Use \leftrightarrow Sex-Expectancies	-2.77	1.53	-0.21	[-0.40, -0.02]	.03
Baseline Condom Use \leftrightarrow Sexual Sensation Seeking	-1.38	0.63	-0.22	[-0.40, -0.04]	.02
Baseline Condom Use \leftrightarrow Between-Person Alcohol	-0.53	0.49	-0.12	[-0.28, 0.03]	.12
Baseline Condom Use \leftrightarrow Condom Information	-0.43	0.27	-0.14	[-0.31, 0.02]	.09
Baseline Condom Use \leftrightarrow Condom Motivation	1.32	0.19	0.70	[0.55, 0.78]	<.001
Baseline Condom Use \leftrightarrow Condom Behavioral Skills	-16.06	4.37	-0.39	[-0.57, -0.21]	<.001
Baseline Condom Use \leftrightarrow Self-Regulation	0.72	0.80	.21	[-0.13, 0.55]	.23
Baseline Condom Use \leftrightarrow Reward-Seeking	-0.03	0.77	-0.004	[-0.22, 0.21]	.97
Sex-Expectancies \leftrightarrow Sexual Sensation Seeking	38.23	12.58	0.48	[0.27, 0.68]	<.001
Sex-Expectancies \leftrightarrow Between-Person Alcohol	27.28	19.39	0.50	[0.18, 0.81]	.002
Sex-Expectancies \leftrightarrow Condom Information	6.78	5.10	0.18	[-0.05, 0.42]	.13
Sex-Expectancies \leftrightarrow Condom Motivation	-7.90	3.61	-0.32	[-0.54, -0.10]	.004
Sex-Expectancies \leftrightarrow Condom Behavioral Skills	154.98	73.77	.30	[0.08, 0.52]	.01

Level-2 Pathway	<i>b</i>	<i>S.E.</i>	β	95% CI	<i>p</i> -value
Sex-Expectancies \leftrightarrow Self-Regulation	-3.34	7.51	-0.08	[-0.45, 0.29]	.68
Sex-Expectancies \leftrightarrow Reward-Seeking	26.30	14.77	.30	[0.04, 0.56]	.03
Sexual Sensation Seeking \leftrightarrow Between-Person Alcohol	8.17	6.10	0.31	[-0.02, 0.64]	.06
Sexual Sensation Seeking \leftrightarrow Condom Information	1.81	1.92	0.10	[-0.10, 0.30]	.33
Sexual Sensation Seeking \leftrightarrow Condom Motivation	-3.60	1.45	-0.30	[-0.53, -0.08]	.01
Sexual Sensation Seeking \leftrightarrow Condom Behavioral Skills	96.35	42.59	0.39	[0.15, 0.63]	.002
Sexual Sensation Seeking \leftrightarrow Self-Regulation	-1.24	3.58	-0.06	[-0.43, 0.31]	.75
Sexual Sensation Seeking \leftrightarrow Reward-Seeking	0.23	8.47	0.01	[-0.39, 0.40]	.98
Between-Person Alcohol \leftrightarrow Condom Information	1.84	2.36	0.15	[-0.17, 0.47]	.36
Between-Person Alcohol \leftrightarrow Condom Motivation	-1.98	1.67	-0.24	[-0.53, 0.05]	.10
Between-Person Alcohol \leftrightarrow Condom Behavioral Skills	42.84	37.39	0.25	[-0.08, 0.59]	.14
Between-Person Alcohol \leftrightarrow Self-Regulation	-3.24	3.10	-0.23	[-0.57, 0.10]	.17
Between-Person Alcohol \leftrightarrow Reward-Seeking	4.09	5.40	0.14	[-0.17, 0.46]	.38
Condom Information \leftrightarrow Condom Motivation	-1.72	0.69	-0.31	[-0.51, -0.11]	.002
Condom Information \leftrightarrow Condom Behavioral Skills	36.87	14.74	0.32	[0.12, 0.51]	.001
Condom Information \leftrightarrow Self-Regulation	-1.87	1.22	-0.20	[-0.47, 0.08]	.17
Condom Information \leftrightarrow Reward-Seeking	-0.80	2.71	-0.04	[-0.30, 0.22]	.76
Condom Motivation \leftrightarrow Condom Behavioral Skills	-47.38	9.69	-0.62	[-0.79, -0.45]	<.001
Condom Motivation \leftrightarrow Self-Regulation	2.09	1.12	0.33	[0.13, 0.53]	.001
Condom Motivation \leftrightarrow Reward-Seeking	0.04	1.57	.003	[-0.23, 0.24]	.98
Condom Behavioral Skills \leftrightarrow Self-Regulation	-13.90	16.10	-0.11	[-0.38, 0.17]	.49
Condom Behavioral Skills \leftrightarrow Reward-Seeking	-59.99	57.55	-0.22	[-0.55, 0.11]	.19
Self-Regulation \leftrightarrow Reward-Seeking	5.73	5.89	0.26	[-0.17, 0.68]	.24
Recruitment Source \rightarrow CVI	-0.01	0.64	-0.004	[-0.38, 0.37]	.98
Gender \rightarrow CVI	-0.07	0.40	-0.02	[-0.21, 0.18]	.86
Baseline Condom Use \rightarrow CVI	-0.58	0.23	-0.31	[-0.53, -0.08]	.01
Sex-Expectancies \rightarrow CVI	-0.001	0.02	-0.004	[-0.26, 0.25]	.98
Sexual Sensation Seeking \rightarrow CVI	0.12	0.03	0.40	[0.21, 0.58]	<.001
Between-Person Alcohol \rightarrow CVI	-0.08	0.07	-0.18	[-0.57, 0.20]	.36
Condom Information \rightarrow CVI	-0.03	0.08	-0.05	[-0.28, 0.18]	.67
Condom Motivation \rightarrow CVI	-0.45	0.16	-0.44	[-0.72, -0.16]	.002
Condom Behavioral Skills \rightarrow CVI	0.004	0.01	0.08	[-0.12, 0.27]	.44
Self-Regulation \rightarrow CVI	0.04	0.06	0.12	[-0.29, 0.52]	.57
Reward-Seeking \rightarrow CVI	0.01	0.04	0.05	[-0.28, 0.38]	.76

Level-1 Pathway	<i>b</i>	<i>S.E.</i>	β	aOR	95% CI	<i>p</i> -value
Number of Standard Drinks → CVI	0.05	0.06	0.06	1.05	[0.93, 1.19]	.43
Other Substance Use → CVI	-0.25	0.43	-0.06	0.78	[0.34, 1.79]	.55
Sexual Partner Type → CVI	0.09	0.21	0.04	1.10	[0.72, 1.66]	.66

Note. Total $N = 128$ College Student Drinkers ($n = 348$ sex events). AIC = 7848.20, BIC = 8260.07, sa-BIC = 7920.64. Level-2 predictors are sample-centered, Level-1 predictors are person-centered. Sex-Expectancies = Alcohol-Related Sex Expectancies; Between-Person Alcohol = sample-centered average number of standard drinks per sexual event. Significant pathways at $p < .05$ are in bold. *b* = unstandardized coefficient, *S.E.* = standard error, β = standardized coefficient, aOR = adjusted Odds Ratio, 95% CI = 95% confidence interval.

The CMACS Study Pre-Screen

Thank you for your interest in The CMACS Study!

Please answer the questions below so that we can determine if you are eligible to participate in the full study. You will receive up to 2 credits for participating in this study. After completing this brief questionnaire, and if eligible to continue, you will have an opportunity to be compensated.

This is an online research study. The purpose of this study is to explore how substance use, psychological factors, and contextual factors contribute to sexual activity. Therefore, this research study will involve completing questionnaires regarding a variety of topics including your attitudes and beliefs about specific subject matters. These topics include substance use (including alcohol use) and sexual activity. You will also complete behavioral tasks that assess psychological factors. If you anticipate that any of these components will cause you to be uncomfortable enough to withdraw your participation, please do not sign up for a study appointment. All information that you provide will remain confidential.

Participation will consist of 2 parts: (1) A survey that will determine participation eligibility (2- minutes); (2) A Zoom videoconference call with study staff for interview about substance use and sexual activity and computerized behavioral tasks (120-minutes, compensation = 2 credits).

Participation will be compensated with a maximum of 2 credits.

- 1) Please click the "Today" button to record today's date. _____
- 2) How old are you? _____
- 3) What term do you think best describes your sexual preference?
 - Heterosexual (Straight) only
 - Heterosexual (Straight) mostly
 - Heterosexual (Straight) somewhat
 - Heterosexual (Straight) / Homosexual (Gay) equal
 - Homosexual (Gay) somewhat more
 - Homosexual (Gay) mostly
 - Homosexual (Gay) only
- 4) During the past 180-days (6-months) how often have you had a drink containing alcohol?
 - Never
 - Less than monthly
 - Once per month
 - 2 to 4 times a month
 - 2 to 3 times a week
 - 4 or more times a week
- 5) How many times have you had vaginal sexual intercourse during the previous 180 days (6-months)? _____
- 6) How often, in the last 180-days (6-months), have you used a condom during vaginal sexual intercourse?

0%

100%

(Place a mark on the scale above)
- 7) Are you currently in a monogamous (exclusive) relationship?
 - Yes
 - No

The CMACS Study

Please complete the survey below.

1. How old are you?

2. What is your date of birth?

3. What is your sex or gender? (check all that apply)

- Male
- Female
- Transgender Male or Transman
- Transgender Female or Transwoman
- Genderqueer
- Additional category. Please specify below
- Decline to state

3a. Please specify your gender (if not specified above)

4. What sex were you assigned at birth?

- Male
- Female
- Decline to answer

5. What term do you think best describes your sexual preference?

- Heterosexual (Straight) only
- Heterosexual (Straight) mostly
- Heterosexual (Straight) somewhat
- Heterosexual (Straight) / Homosexual (Gay) equal
- Homosexual (Gay) somewhat more
- Homosexual (Gay) mostly
- Homosexual (Gay) only

6. How do you identify your sexual orientation?

- Heterosexual/straight
- Homosexual/gay/queer
- Bisexual
- Additional category
- Not sure
- Decline to Answer

Please describe your sexual orientation

8. What is your current academic class?

- Freshman
- Sophomore
- Junior
- Senior

9. Do you identify as Hispanic or Latinx?

- Yes
- No
- Decline to Answer

10. How do you identify your race or ethnicity?

- American Indian/Alaska Native
- Asian/Pacific Islander
- Black or African American
- Caucasian/White
- Mixed Race
- Another ethnicity (specify)
- Decline to Answer

10a. How would you describe your ethnicity?

11. Please describe your academic status

- Full-time
- Part-time
- Not in school

12. Are you currently working?

- Full-time (35 hours a week, or more)
- Part-time (less than 35 hours per week)
- Retired
- Unemployed
- Disability
- Decline to Answer

13. What college/university do you attend?

14. What state is your college/university in?

15. What is your overall grade point average (GPA)?

16. Are you a native English speaker?

COVID-19 Questionnaire

Please complete the survey below.

Thank you!

The next set of questions are related to the ways in which the COVID-19 pandemic has impacted your daily life.

Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China. This next set of questions discuss how the COVID-19 pandemic has affected you.

In your area, what is the management plan for COVID-19/Coronavirus? (select all that you are aware of)

- Bars are closed
- Eating in restaurants is not allowed
- Gathering in larger groups (more than 10 or 50 people) is not allowed
- Gathering in any groups anywhere is not allowed
- Retail shops are closed
- School/in-person classes are closed
- Work hours have been reduced
- Work is cancelled
- A curfew is in place
- People are asked to remain home/in place of residence
- Public transportation is limited or closed
- Access to services (community centers, assistance programs, or other resources) are restricted/closed
- Clinic service hours are reduced/restricted

Compared to the time before COVID-19/Coronavirus, please tell us if COVID-19 and the plans used to manage COVID-19 have impacted you. Please tell us only if it has changed because of COVID-19.

- General quality of life
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Levels of anxiety
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Levels of depression
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Quality of sleep
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Feeling connected to family
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Access to resources (food, money)
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Access to internet/stability of internet
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Number of sexual partners
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19
- Opportunities to have sex
- Has highly decreased because of COVID-19
 - Has somewhat decreased because of COVID-19
 - Has not changed/no different because of COVID-19
 - Has somewhat increased because of COVID-19
 - Has highly increased because of COVID-19

Your use of dating/hook-up apps to connect virtually

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Access to condoms

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Use of condoms

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Your use of dating/hook-up apps to meet others in person

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Access to STI testing or treatment

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Use of recreational drugs

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

Alcohol consumption

- Has highly decreased because of COVID-19
 Has somewhat decreased because of COVID-19
 Has not changed/no different because of COVID-19
 Has somewhat increased because of COVID-19
 Has highly increased because of COVID-19

On what date did you LEAVE your university/college campus due to COVID-19?

On what date did you RETURN to your university/college campus?

Where and with whom are you currently living?

- Alone in my own home/apartment
 Parent(s)/Guardian(s)
 Parent(s)/Guardian(s) and sibling(s)
 Roommate(s)/friend(s)
 Romantic partner(s)
 Roommate(s)/Friend(s)/Romantic partner(s)
 Other

Other:

What is the zip code of your current residence?

(home zip code)

What is the zip code of your on-campus residence?

(campus zip code)

Since the COVID-19 outbreak, have YOU received medical treatment for symptoms of the virus?

- Yes
 No

Since the COVID-19 outbreak, have YOU been tested for the virus?

- Yes
 No

Since the COVID-19 outbreak, have YOU received a positive diagnosis of the virus?

- Yes
 No

Since the COVID-19 outbreak, has a friend or family member received medical treatment for symptoms of the virus?

- Yes
 No

Since the COVID-19 outbreak, has a friend or family member been tested for the virus?

- Yes
 No

Since the COVID-19 outbreak, has a friend or family member received a positive diagnosis for the virus?

- Yes
 No

How has the COVID-19 pandemic affected how often you have been drinking alcohol?

- I have been drinking much less frequently than usual
 I have been drinking slightly less frequently than usual
 I have been drinking with the same frequency as usual
 I have been drinking slightly more frequently than usual
 I have been drinking much more frequently than usual

How has the COVID-19 pandemic affected how much alcohol you have been drinking?

- I have been drinking much less than usual
 I have been drinking slightly less than usual
 I have been drinking the same amount as usual
 I have been drinking slightly more than usual
 I have been drinking much more than usual

How has the COVID-19 pandemic affected your sexual activity?

- I have been having sex much less than usual
 I have been having sex slightly less than usual
 I have been having sex the same amount as usual
 I have been having sex slightly more than usual
 I have been having sex much more than usual

How has the COVID-19 pandemic affected your sexual relationships?

- I have been having sex with a lot fewer people than usual
 I have been having sex with slightly fewer people than usual
 I have been having sex with the same number of people as usual
 I have been having sex with slightly more people than usual
 I have been having sex with many more people than usual

How has the COVID-19 pandemic affected your ability to access condoms?

- It has been much more difficult to access condoms
 It has been slightly more difficult to access condoms
 It has not affected my ability to access condoms
 It has been slightly more easy to access condoms
 It has been much easier to access condoms

Pandemic Stress Index

Please complete the survey below.

Thank you!

What are you doing/did you do during COVID-19 (coronavirus)? (Check all that apply)

- No changes to my life or behavior
- Practicing social distancing (i.e., reducing your physical contact with other people in social, work, or school settings by avoiding large groups and staying 3-6 feet away from other people)
- Isolating or quarantining yourself (i.e., while you are sick or if you have been exposed, separating yourself from other people to prevent others from getting it)
- Caring for someone at home
- Working from home
- Not working
- A change in use of healthcare services (e.g., calling your healthcare provider, going to urgent care, etc.)
- Following media coverage related to COVID-19 (e.g., watching or reading the news, following social media coverage, etc.)
- Changing travel plans

Regarding social distancing: How long have you been doing/did you do this for? [days]

Regarding social distancing: Of these [pandemic_eng_1_2_1] days, how many did you end up needing to be physically near people (i.e., you were not able to practice social distancing on those days)?

Regarding social distancing: Did you choose to do this yourself or did someone else require you to?

- Myself
- Someone else

Regarding social distancing: Did you do this to protect someone else in your household?

- Yes
- No

Regarding isolating or quarantining yourself: How long have you been doing/did you do this for? [days]

Regarding isolating or quarantining yourself: Of these [pandemic_eng_1_3_1] days, how many did you end up needing to be physically near people (i.e., you were not able to practice social distancing on those days)?

Regarding isolating or quarantining yourself: Did you choose to do this yourself or did someone else require you to?

- Myself
- Someone else

Regarding isolating or quarantining yourself: Did you do this to protect someone else in your household?

- Yes
- No

Regarding caring for someone at home: Whom?

- A child or children
- An elderly person

Regarding working from home: Did you have to balance this with taking care of others [e.g., parents, kids, partners]?

- Yes
- No

Regarding not working: Did you lose your source of income because of COVID-19/coronavirus?

- Yes
- No

Regarding not working: Why? (check all that apply)

- Because I am/was sick or under quarantine
- Because someone in my household was sick/under quarantine
- Because my place of work was closed and didn't offer a remote work option
- Because I was laid off or lost my employment

Regarding a change in use of healthcare services: Was this an increase or decrease?

- Increase
- Decrease

Regarding following media coverage related to COVID-19: On average, how many hours per day did you spend on this?

Regarding changing travel plans: Did you travel more or less?

- More
- Less

How much is/did COVID-19 (coronavirus) impact your day-to-day life?

- Not at all
- A little
- Much
- Very Much
- Extremely
- Decline to answer

Which of the following are you experiencing (or did you experience) during COVID-19 (coronavirus)? (check all that apply)

- Being diagnosed with COVID-19
- Fear of getting COVID-19
- Fear of giving COVID-19 to someone else
- Worrying about friends, family, partners, etc.
- Stigma or discrimination from other people (e.g., people treating you differently because of your identity, having symptoms, or other factors related to COVID-19)
- Personal financial loss (e.g., lost wages, job loss, investment/retirement loss, travel-related cancelations)
- Frustration or boredom
- Not having enough basic supplies (e.g., food, water, medications, a place to stay)
- More anxiety
- More depression
- More sleep, less sleep, or other changes to your normal sleep pattern
- Increased alcohol or other substance use
- A change in sexual activity
- Loneliness
- Confusion about what COVID-19 is, how to prevent it, or why social distancing/isolation/quarantines are needed
- Feeling that I was contributing to the greater good by preventing myself or others from getting COVID-19
- Getting emotional or social support from family, friends, partners, a counselor, or someone else
- Getting financial support from family, friends, partners, an organization, or someone else
- Other difficulties or challenges

Regarding worrying about friends, family, partners, etc.

- Locally
- In other parts of the US
- Outside the US

Regarding a change in sexual activity: Was this an increase or decrease?

- Increase
- Decrease

Regarding other difficulties or challenges: We want to hear from you! Please tell us more

Please complete the survey below.

Thank you!

The next set of questions asks about your sexual behavior. It is extremely important that you be truthful. Remember, your name does not appear anywhere on this survey. Please answer these questions honestly to the best of your knowledge.

"Having sex" means performing oral sex on a partner; receiving oral sex from a partner; insertive/receptive vaginal sex; and insertive/receptive anal sex.

IN YOUR ENTIRE LIFE:

How many different partners have you had sex with?

_____ (Partners)

Please write the number:

IN THE PAST YEAR:

How many different partners have you had sex with?

_____ (Partners)

Please write the number:

In the past year, when you had sex, how often have you used condoms?

- Never
- Rarely
- Sometimes
- Often
- Always

Now, think back carefully over the past 3 months. Think of places you've been, people you've met, and things you've done. Please answer these questions about the past 3 months.

How many partners have you had sex with in the past 3 months?

_____ (Partners)

Please write the number:

How many times did you have sex while using a condom in the past 3 months?

_____ (times with condoms)

Please write the number:

How many times did you have sex without using a condom in the past 3 months?

_____ (times without condoms)

Please write the number:

How many times in the past month did you have sex using a condom?

_____ (times with condoms)

Please write the number:

How many times in the past month did you have sex without using a condom?

_____ (times without condoms)

Please write the number:

Please indicate which of the following sexually transmitted diseases (STDs) or infections you have had in your lifetime?

- Human Papilloma Virus (HPV)
- Genital Warts
- Genital lice (crabs)
- Herpes
- Chlamydia
- Cytomegalovirus (CMV)
- Gonorrhea
- Hepatitis
- Syphilis
- Trichomoniasis
- None of the above

Did you receive medical treatment for any of these conditions?

- Yes
- No

Did you receive medical treatment for any of these conditions during the previous year (12-months)?

- Yes
- No

Did you receive medical treatment for any of these conditions during the 3 months (90-days)?

- Yes
- No

Most-Recent Sexual Event Pre-COVID-19 #1

Please complete the survey below.

Thank you!

The next set of questions will be asking you about your sexual behavior and substance use PRIOR to the COVID-19 Pandemic.

What you're going to do is try to recall the details associated with the three-most-recent sexual events that you engaged in before March 13, 2020 (the date the US government announced a state of emergency). We will be asking you detailed questions about each of the events separately.

We encourage you to use anything and everything that would be helpful for your memory. Examples might be old text messages, social media applications (e.g., Snapchat memories, Tinder conversations), photos, or calendars.

In helping you to fill out the details, we want you to be as accurate as possible, but we realize that it is hard for anyone to recall things perfectly. So, if you can't recall, for example, whether you did something on a Monday or a Thursday of a certain week, just give it your best guess.

Event #1:

What is the date of the most-recent time you engaged in sexual activity BEFORE March 13, 2020?

How many partners did you engage in oral, anal, or vaginal sex with on this date?

For the FIRST partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

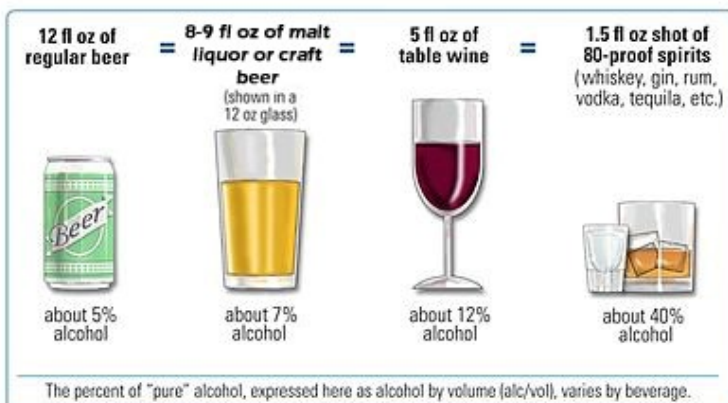
What was the context/situation/environment that led to engaging in sexual activity?

- A date
 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
 (Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).



What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
 - Sedatives, Hypnotics, or Anxiolytics
 - Stimulants (e.g., Adderall)
 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the SECOND partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

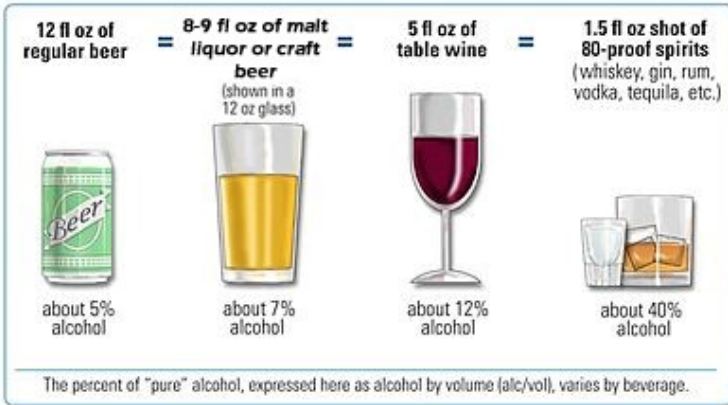
What was the context/situation/environment that led to engaging in sexual activity?

- A date
 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
(Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

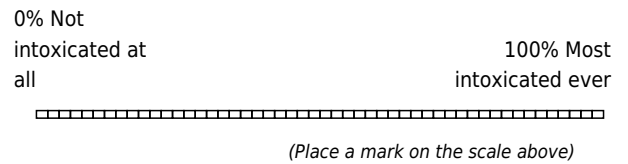


What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
 - Sedatives, Hypnotics, or Anxiolytics
 - Stimulants (e.g., Adderall)
 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the THIRD partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

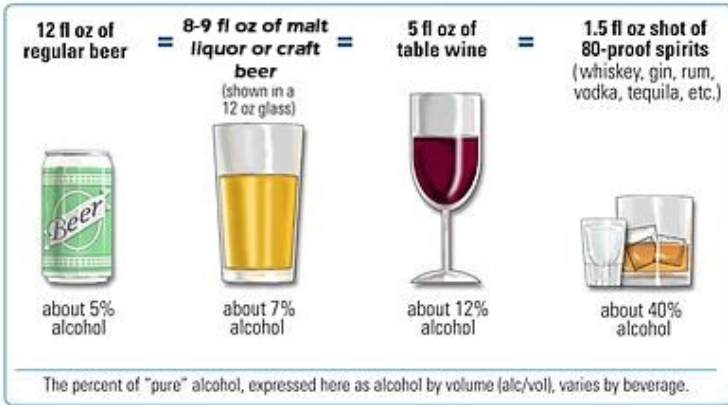
What was the context/situation/environment that led to engaging in sexual activity?

- A date
 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
(Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

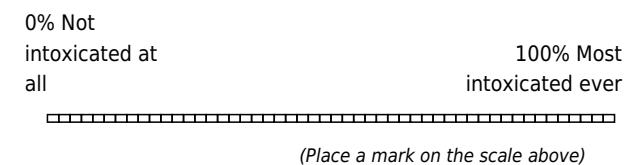


What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
 - Sedatives, Hypnotics, or Anxiolytics
 - Stimulants (e.g., Adderall)
 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the FOURTH partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

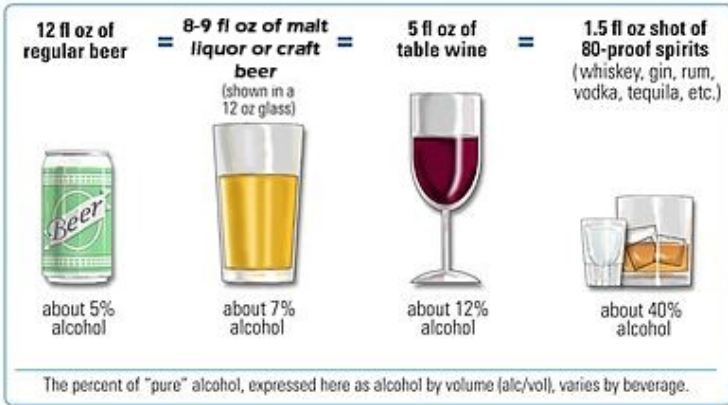
What was the context/situation/environment that led to engaging in sexual activity?

- A date
 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
(Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

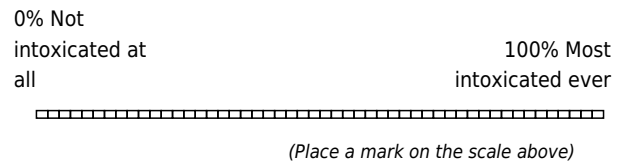


What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
 - Sedatives, Hypnotics, or Anxiolytics
 - Stimulants (e.g., Adderall)
 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



Most-Recent Sexual Event Pre-COVID-19 #2

Please complete the survey below.

Thank you!

The next set of questions will be asking you about your sexual behavior and substance use PRIOR to the COVID-19 Pandemic.

What you're going to do is try to recall the details associated with the three-most-recent sexual events that you engaged in before March 13, 2020 (the date the US government announced a state of emergency). We will be asking you detailed questions about each of the events separately.

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Event #2:

What is the date of the most-recent time you engaged in sexual activity BEFORE the event you described in the previous set of questions [mrse_1_1]?

How many partners did you engage in oral, anal, or vaginal sex with on this date?

For the FIRST partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

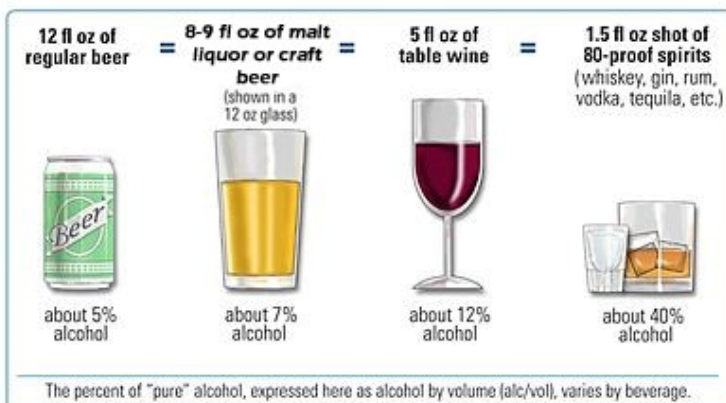
What was the context/situation/environment that led to engaging in sexual activity?

- A date
 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
 (Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).



What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
 - Sedatives, Hypnotics, or Anxiolytics
 - Stimulants (e.g., Adderall)
 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the SECOND partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
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(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

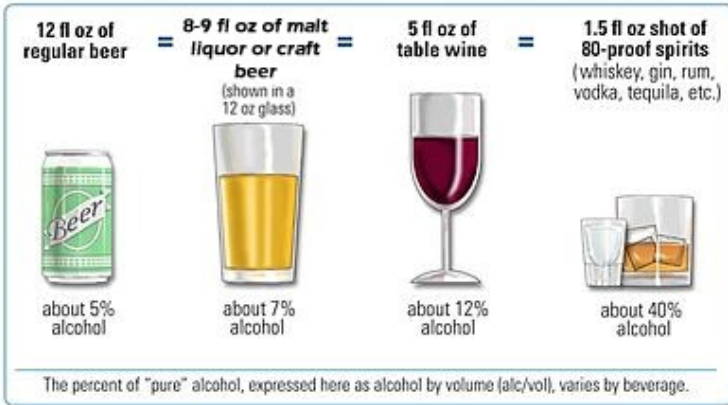
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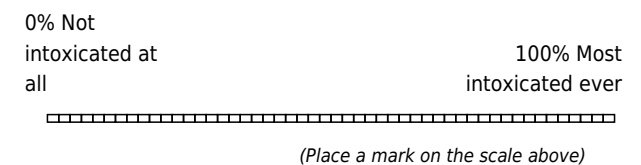


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 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the THIRD partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

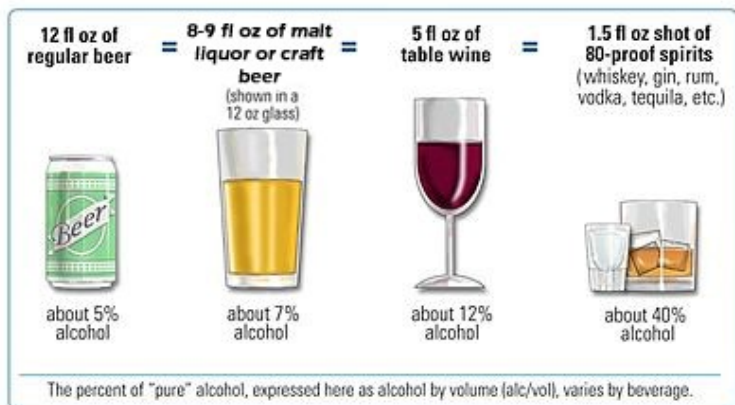
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 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
(Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

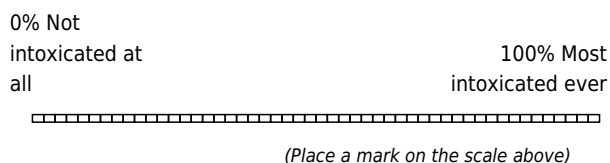


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 - Synthetic Cannabis (e.g., spic)
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 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the FOURTH partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

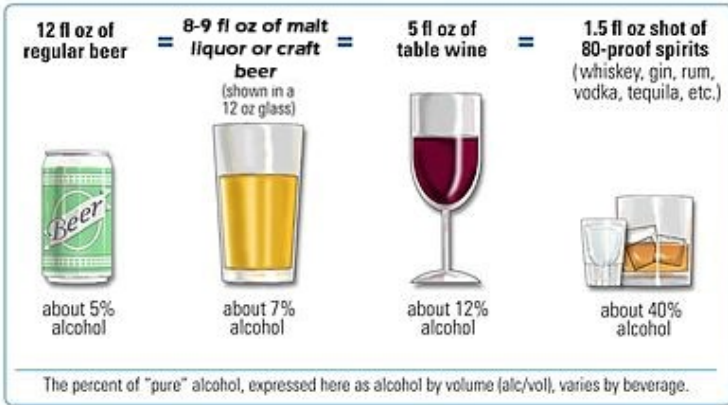
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 A frat party
 A house party
 A bar/restaurant
 A pre-determined meetup for sex (e.g., bootycall)
 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
(Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).

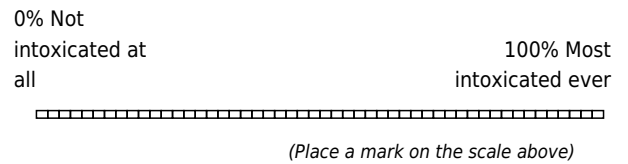


What other substances besides alcohol did you consume before/during the sexual event?

- Cannabis
 - Synthetic Cannabis (e.g., spic)
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 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



Most-Recent Sexual Event Pre-COVID-19 #3

Please complete the survey below.

Thank you!

The next set of questions will be asking you about your sexual behavior and substance use PRIOR to the COVID-19 Pandemic.

What you're going to do is try to recall the details associated with the three-most-recent sexual events that you engaged in before March 13, 2020 (the date the US government announced a state of emergency). We will be asking you detailed questions about each of the events separately.

We encourage you to use anything and everything that would be helpful for your memory. Examples might be old text messages, social media applications (e.g., Snapchat memories, Tinder conversations), photos, or calendars.

In helping you to fill out the details, we want you to be as accurate as possible, but we realize that it is hard for anyone to recall things perfectly. So, if you can't recall, for example, whether you did something on a Monday or a Thursday of a certain week, just give it your best guess.

Event #3:

What is the date of the most-recent time you engaged in sexual activity BEFORE the event you described in the previous set of questions [mrse_1_1_v2] ?

How many partners did you engage in oral, anal, or vaginal sex with on this date?

For the FIRST partner you had sex with on this day, was this the first time you had sex with this partner?

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

Yes

No

New

Casual

Regular

Male

Female

What was this partner's STD status?

- Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Anal Sex?

- Yes
 No

Did you use a condom during this act?

- Yes
 No

Was a condom easily accessible during this sexual encounter?

- Yes
 No

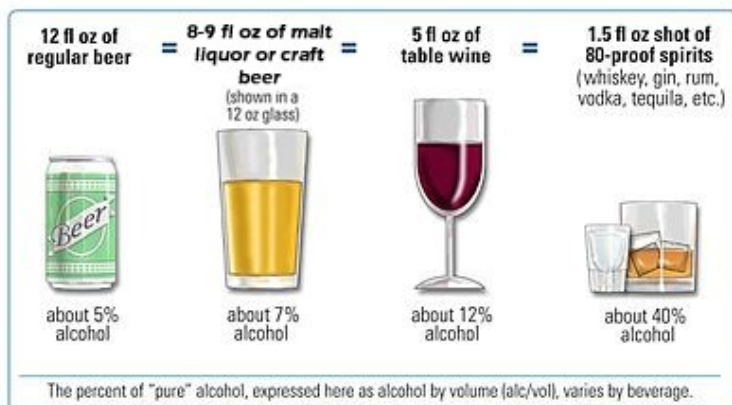
What was the context/situation/environment that led to engaging in sexual activity?

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 A casual hangout
 A get-together with friends
 An exchange of monetary compensation or goods for sex
 Other
 (Choose the option that best fits)

Describe "other" here:

How many standard drinks of alcohol did you consume before/during this sexual event?

By a standard drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).



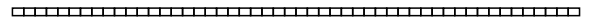
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 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?

0% Not intoxicated at all 100% Most intoxicated ever



(Place a mark on the scale above)

For the SECOND partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

- New
 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
 Negative
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Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
 No

Did you use a condom during this act?

- Yes
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Vaginal Sex?

- Yes
 No

Did you use a condom during this act?

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Anal Sex?

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Did you use a condom during this act?

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Was a condom easily accessible during this sexual encounter?

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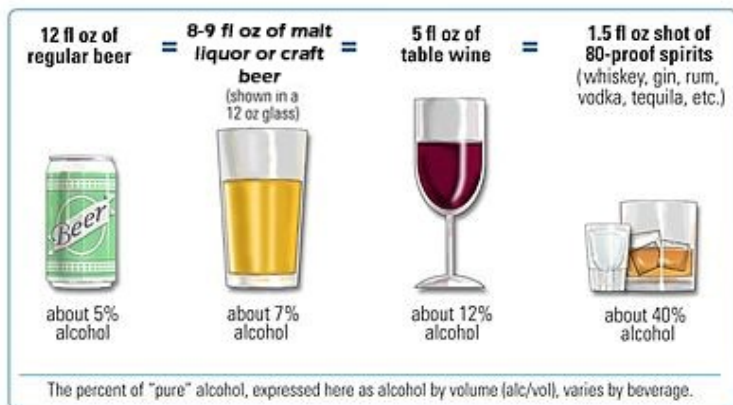
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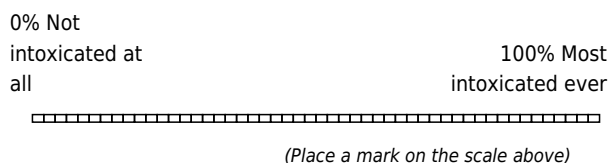


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 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



For the THIRD partner you had sex with on this day, was this the first time you had sex with this partner?

- Yes
 No

What was the date of this first time you had sex with this partner? (MM-DD-YYYY)

Was this person a casual, regular, or new sex partner?

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 Casual
 Regular

(Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

What was the gender of this partner?

- Male
 Female

What was this partner's STD status?

- Positive
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Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

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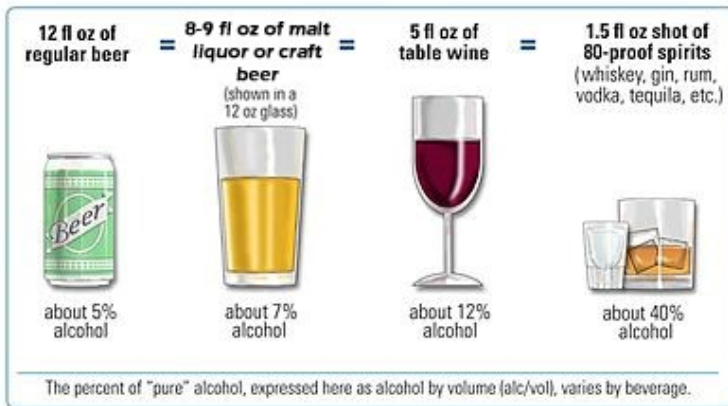
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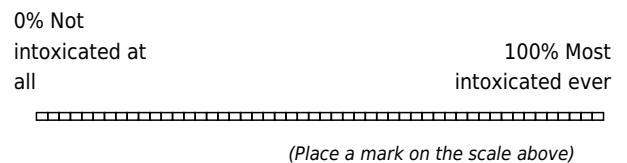


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- Yes
 No

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What was the gender of this partner?

- Male
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What was this partner's STD status?

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 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

- Yes
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Vaginal Sex?

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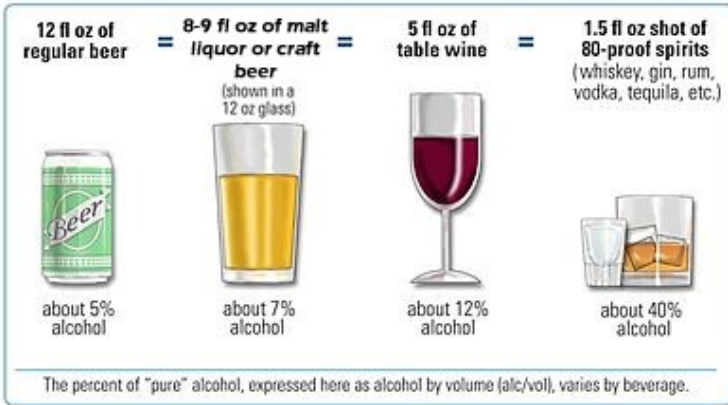
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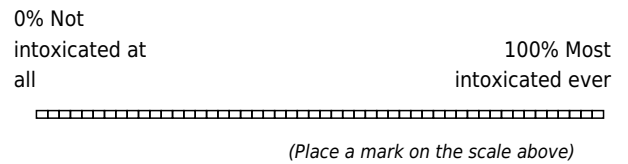


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 - Opioids (e.g., heroin, oxycontin)
 - Hallucinogens (e.g., LSD, mushrooms)
 - Phencyclidine and Related Substances (e.g., PCP)
 - Other
 - None
- (choose all that apply)

Identify all other drugs that you used here:

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?



Sexual Sensation Seeking Scale

Please complete the survey below.

Thank you!

- 1) I like wild "uninhibited" sexual encounters.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 2) The physical sensations are the most important thing about having sex.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 3) I enjoy the sensation of intercourse without a condom.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 4) My sexual partners probably think I am a "risk taker".
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 5) When it comes to sex, physical attraction is more important to me than how well I know the person.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 6) I enjoy the company of "sensual" people.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 7) I enjoy watching "X-rated" videos.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 8) I have said things that were not exactly true to get a person to have sex with me.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 9) I am interested in trying out new sexual experiences.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 10) I feel like exploring my sexuality.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me
- 11) I like to have new and exciting sexual experiences and sensations.
 - Not at all like me
 - Slightly like me
 - Mainly like me
 - A lot like me

Sex-Related Alcohol Expectancies

Please complete the survey below.

Thank you!

- 1) After a few drinks of alcohol, I feel closer to a sexual partner.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 2) After a few drinks of alcohol, I am more sexually responsive.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 3) After a few drinks of alcohol, I am less nervous about sex.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 4) After a few drinks of alcohol, I enjoy sex more than usual.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 5) After a few drinks of alcohol, I am a better lover.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 6) After a few drinks of alcohol, I am less likely to use birth control.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 7) After a few drinks of alcohol, I am less likely to take precautions before having sex.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 8) After a few drinks of alcohol, I am less likely to talk with a new sexual partner about whether he (she) has a sexually transmitted disease, like AIDS or gonorrhea.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree

- 9) After a few drinks of alcohol, I am less likely (to ask a partner) to use a condom.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 10) After a few drinks of alcohol, I have sex with people whom I wouldn't have sex with if I were sober.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 11) After a few drinks of alcohol, I am more likely to do sexual things that I wouldn't do when sober.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 12) After a few drinks of alcohol, I find it harder to say no to sexual advances.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 13) After a few drinks of alcohol, I am more likely to have sex on a first date.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree

Sexually Transmitted Disease Knowledge Questionnaire

Please complete the survey below.

Thank you!

For each statement below please select: True, False, or I Don't Know. If you don't know, please do not guess and instead select: I Don't Know.

- 1) Genital Herpes is caused by the same virus as HIV
 True
 False
 Don't Know
- 2) Frequent urinary infections can cause Chlamydia
 True
 False
 Don't Know
- 3) There is a cure for Gonorrhea
 True
 False
 Don't Know
- 4) It is easier to get HIV if a person has another Sexually Transmitted Disease
 True
 False
 Don't Know
- 5) Human Papillomavirus (HPV) is caused by the same virus that causes HIV
 True
 False
 Don't Know
- 6) Having anal sex increases a person's risk of getting Hepatitis B
 True
 False
 Don't Know
- 7) Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina)
 True
 False
 Don't Know
- 8) Please select the third option for this question
 Pink
 Purple
 Orange
 Blue
- 9) There is a cure for Chlamydia
 True
 False
 Don't Know
- 10) A woman who has Genital Herpes can pass the infection to her baby during childbirth
 True
 False
 Don't Know
- 11) A woman can look at her body and tell if she has Gonorrhea
 True
 False
 Don't Know
- 12) The same virus causes all of the Sexually Transmitted Diseases
 True
 False
 Don't Know
- 13) Human Papillomavirus (HPV) can cause Genital Warts
 True
 False
 Don't Know

- 14) Using a natural skin (lambskin) condom can protect a person from getting HIV
- True
 False
 Don't Know
- 15) Human Papillomavirus (HPV) can lead to cancer in women
- True
 False
 Don't Know
- 16) A man must have vaginal sex to get Genital Warts
- True
 False
 Don't Know
- 17) Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women
- True
 False
 Don't Know
- 18) A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina
- True
 False
 Don't Know
- 19) If a person tests positive for HIV the test can tell how sick the person will become
- True
 False
 Don't Know
- 20) There is a vaccine available to prevent a person from getting Gonorrhea
- True
 False
 Don't Know
- 21) A woman can tell by the way her body feels if she has a Sexually Transmitted Disease
- True
 False
 Don't Know
- 22) A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner
- True
 False
 Don't Know
- 23) There is a vaccine that prevents a person from getting Chlamydia
- True
 False
 Don't Know
- 24) A man can tell by the way his body feels if he has Hepatitis B
- True
 False
 Don't Know
- 25) If a person had Gonorrhea in the past he or she is immune (protected) from getting it again
- True
 False
 Don't Know
- 26) Human Papillomavirus (HPV) can cause HIV
- True
 False
 Don't Know
- 27) A man can protect himself from getting Genital Warts by washing his genitals after sex
- True
 False
 Don't Know
- 28) There is a vaccine that can protect a person from getting Hepatitis B
- True
 False
 Don't Know
- 29) Condoms can be used more than once
- True
 False
 Don't Know

- 30) Condoms are an effective method of preventing pregnancy
- True
 False
 Don't Know
- 31) A condom is a rubber device that a man can put on his penis before intercourse
- True
 False
 Don't Know
- 32) Condoms are an effective method of protecting against HIV/AIDS
- True
 False
 Don't Know
- 33) Condoms are an effective method of protecting against STIs
- True
 False
 Don't Know

UCLA Multifactorial Condom Attitude Scale

Please complete the survey below.

Thank you!

- 1) Condoms are an effective method of birth control.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 2) Condoms are an effective method of preventing the spread of AIDS and other sexually transmitted diseases.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 3) I think condoms are an excellent means of contraception.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 4) Condoms are unreliable.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 5) Condoms do not offer reliable protection.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree
- 6) The use of condoms can make sex more stimulating.
 - Strongly Disagree
 - Somewhat Disagree
 - Slightly Disagree
 - Neither Agree nor Disagree
 - Slightly Agree
 - Somewhat Agree
 - Strongly Agree

- 7) Condoms ruin the sex act.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 8) Condoms are uncomfortable for both partners.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 9) Condoms are a lot of fun.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 10) Use of a condom is an interruption of foreplay.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 11) Men who suggest using a condom are really boring.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 12) If a couple is about to have sex and the man suggests using a condom, it is less likely that they will have sex.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 13) Women think men who use condoms are jerks.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 14) A woman who suggests using a condom does not trust her partner.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree

- 15) People who suggest condom use are a little bit geeky.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 16) When I suggest using a condom, I am almost embarrassed.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 17) It is really hard to bring up the issue of using condoms to my partner.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 18) It is easy to suggest to my partner that we use a condom.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 19) I'm comfortable talking about condoms with my partner.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 20) I never know what to say when my partner and I need to talk about condoms or other protection.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 21) It is very embarrassing to buy condoms.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree
- 22) When I need condoms, I often dread having to get them.
- Strongly Disagree
 Somewhat Disagree
 Slightly Disagree
 Neither Agree nor Disagree
 Slightly Agree
 Somewhat Agree
 Strongly Agree

23) I don't think that buying condoms is awkward.

- Strongly Disagree
- Somewhat Disagree
- Slightly Disagree
- Neither Agree nor Disagree
- Slightly Agree
- Somewhat Agree
- Strongly Agree

24) It would be embarrassing to be seen buying condoms in a store.

- Strongly Disagree
- Somewhat Disagree
- Slightly Disagree
- Neither Agree nor Disagree
- Slightly Agree
- Somewhat Agree
- Strongly Agree

25) I always feel really uncomfortable when I buy condoms.

- Strongly Disagree
- Somewhat Disagree
- Slightly Disagree
- Neither Agree nor Disagree
- Slightly Agree
- Somewhat Agree
- Strongly Agree

26) How motivated were you to use a condom during sexual intercourse during the previous 90-days?

- Not at all Motivated
- Slightly Motivated
- Somewhat Motivated
- Motivated
- Very Motivated
- Strongly Motivated
- Extremely Motivated

Condom Influence Strategy Questionnaire

Please complete the survey below.

Thank you!

How likely are you to use these strategies?

- 1) Tell my partner that I will not have sex with him/her if we do not use condoms.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 2) Make it clear that I will not have sex if condoms are not used.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 3) Let my partner know that no condoms means no sex.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 4) Refuse to have sex with my partner unless condoms are used.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 5) Tell my partner that we are going to use a condom...there's no question about it.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 6) Tell my partner that I have made the decision to use condoms, and so we are going to use them.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 7) Request that my partner go along with the use of a condom.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 8) Ask that we use condoms during sex.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely
- 9) Make a direct request to use condoms.
 - Very Likely
 - Likely
 - Neither Likely nor Unlikely
 - Unlikely
 - Very Unlikely

- 10) Be clear that I'd like us to use condoms.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 11) Tell my partner that I would be more comfortable using a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 12) Say that since we're going to have sex, I'd like to use condoms.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 13) Start "fooling around" and then pull out a condom when it was time.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 14) Take out a condom to use without saying a word.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 15) Begin putting a condom on at the appropriate time.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 16) Get my partner very sexually excited and then take out a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 17) Take a condom out during foreplay.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 18) In the heat of the moment, I would take a condom out to use.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 19) Tell my partner that if he/she really loves me than he/she will use a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely

- 20) Tell my partner that since we love and trust one another, that we should use condoms.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 21) Let my partner know that using a condom would show respect for my feelings.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 22) Tell my partner that it would really mean a lot to our relationship if he/she would use a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 23) Tell my partner that using a condom would really show how he/she cares for me.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 24) Stress that my partner should accept my request to use a condom because we care about each other.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 25) Tell my partner that we both would be safer from disease if we used a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 26) Tell my partner that if we don't use condoms, then one of us could end up with a sexually transmitted disease (STD).
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 27) Explain to my partner that there are too many sexually transmitted diseases (STD's) going around to not use a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 28) Let my partner know that there are so many sexual diseases out there that we should use condoms.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 29) Tell my partner that using a condom will protect us from sexually transmitted diseases (STD's).
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely

- 30) Tell my partner that we need to use condoms to protect ourselves from AIDS.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 31) Tell my partner that we should use a condom to prevent pregnancy, even though my real worry is sexually transmitted diseases (STD's).
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 32) Make up a reason why I want him/her to use a condom, even though my real reason is to protect myself against diseases.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 33) Tell my partner I only have sex with condoms, even though sometimes I don't.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 34) Make up a reason why we should use condoms to get my partner to use them.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 35) Make my partner think I always use condoms when I have sex, even though sometimes I don't.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 36) Pretend that I'm really concerned about pregnancy, when my real concern is sexually transmitted diseases.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 37) Tell my partner that in order to avoid pregnancy that we should use a condom.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 38) Stress to my partner that we need to use a condom for birth control.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely
- 39) Explain that not using a condom could result in a pregnancy.
- Very Likely
 Likely
 Neither Likely nor Unlikely
 Unlikely
 Very Unlikely

40) Tell my partner that since we're not using any other form of birth control, that we should use a condom.

- Very Likely
- Likely
- Neither Likely nor Unlikely
- Unlikely
- Very Unlikely

41) Make it clear that condoms are necessary for us to avoid pregnancy.

- Very Likely
- Likely
- Neither Likely nor Unlikely
- Unlikely
- Very Unlikely

42) Say that by using a condom we won't have to worry about pregnancy.

- Very Likely
- Likely
- Neither Likely nor Unlikely
- Unlikely
- Very Unlikely

Please complete the survey below.

Thank you!

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement.

Be sure to indicate your agreement or disagreement for every statement below.

- 1) I have a reserved and cautious attitude toward life.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 2) I have trouble controlling my impulses.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 3) I generally seek new and exciting experiences and sensations.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 4) I generally like to see things through to the end.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 5) When I am very happy, I can't seem to stop myself from doing things that can have bad consequences.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 6) My thinking is usually careful and purposeful.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 7) I have trouble resisting my cravings (for food, cigarettes, etc.).
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 8) I'll try anything once.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 9) I tend to give up easily.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 10) When I am in great mood, I tend to get into situations that could cause me problems.
 Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly

- 11) I am not one of those people who blurt out things without thinking.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 12) I often get involved in things I later wish I could get out of.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 13) I like sports and games in which you have to choose your next move very quickly.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 14) Unfinished tasks really bother me.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 15) When I am very happy, I tend to do things that may cause problems in my life.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 16) Select option #1 for this question
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 17) I like to stop and think things over before I do them.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 18) When I feel bad, I will often do things I later regret in order to make myself feel better now.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 19) I would enjoy water skiing.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 20) Once I get going on something I hate to stop.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 21) I tend to lose control when I am in a great mood.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 22) I don't like to start a project until I know exactly how to proceed.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 23) Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly

- 24) I quite enjoy taking risks.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 25) I concentrate easily.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 26) When I am really ecstatic, I tend to get out of control.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 27) I would enjoy parachute jumping.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 28) I finish what I start.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 29) I tend to value and follow a rational, "sensible" approach to things.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 30) When I am upset I often act without thinking.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 31) Others would say I make bad choices when I am extremely happy about something.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 32) I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 33) I am able to pace myself so as to get things done on time.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 34) I usually make up my mind through careful reasoning.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 35) When I feel rejected, I will often say things that I later regret.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 36) Others are shocked or worried about the things I do when I am feeling very excited.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly

- 37) I would like to learn to fly an airplane.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 38) I am a person who always gets the job done.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 39) I am a cautious person.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 40) It is hard for me to resist acting on my feelings.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 41) When I get really happy about something, I tend to do things that can have bad consequences.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 42) I sometimes like doing things that are a bit frightening.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 43) I almost always finish projects that I start.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 44) Before I get into a new situation I like to find out what to expect from it.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 45) I often make matters worse because I act without thinking when I am upset.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 46) When overjoyed, I feel like I can't stop myself from going overboard.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 47) I would enjoy the sensation of skiing very fast down a high mountain slope.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 48) Sometimes there are so many little things to be done that I just ignore them all.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 49) I usually think carefully before doing anything.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly

- 50) When I am really excited, I tend not to think of the consequences of my actions.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 51) In the heat of an argument, I will often say things that I later regret.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 52) I would like to go scuba diving.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 53) I tend to act without thinking when I am really excited.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 54) I always keep my feelings under control.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 55) When I am really happy, I often find myself in situations that I normally wouldn't be comfortable with.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 56) Before making up my mind, I consider all the advantages and disadvantages.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 57) I would enjoy fast driving.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 58) When I am very happy, I feel like it is ok to give in to cravings or overindulge.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 59) Sometimes I do impulsive things that I later regret.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly
- 60) I am surprised at the things I do while in a great mood.
- Agree Strongly
 Agree Some
 Disagree Some
 Disagree Strongly

Future Orientation Scale

Please complete the survey below.

Thank you!

- 1) Statement 1: Some people like to plan things out one step at a time
- BUT
- Statement 2: Other people like to jump right into things without planning them out beforehand
- 2) Statement 1: Some people spend very little time thinking about how things might be in the future
- BUT
- Statement 2: Other people spend a lot of time thinking about how things might be in the future
- 3) Statement 1: Some people like to think about all of the possible good and bad things that can happen before making a decision
- BUT
- Statement 2: Other people don't think it's necessary to think about every little possibility before making a decision
- 4) Statement 1: Some people usually think about the consequences before they do something
- BUT
- Statement 2: Other people just act-they don't waste time thinking about the consequences
- 5) Statement 1: Some people would rather be happy today than take their chances on what might happen in the future
- BUT
- Statement 2: Other people will give up their happiness now so that they can get what they want in the future
- 6) Statement 1: Some people are always making lists of things to do
- BUT
- Statement 2: Other people find making lists of things to do a waste of time
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me
- Statement 1 is Really True for Me
○ Statement 1 is Sort of True for Me
○ Statement 2 is Sort of True for Me
○ Statement 2 is Really True for Me

- 7) Statement 1: Some people make decisions and then act without making a plan
- BUT
- Statement 2: Other people usually make plans before going ahead with their decisions
- 8) Statement 1: Some people would rather save their money for a rainy day than spend it right away on something fun
- BUT
- Statement 2: Other people would rather spend their money right away on something fun than save it for a rainy day
- 9) Statement 1: Some people have trouble imagining how things might play out over time
- BUT
- Statement 2: Other people are usually pretty good at seeing in advance how one thing can lead to another
- 10) Statement 1: Some people don't spend much time worrying about how their decisions will affect others
- BUT
- Statement 2: Other people think a lot about how their decisions will affect others
- 11) Statement 1: Some people often think what their life will be like 10 years from now
- BUT
- Statement 2: Other people don't even try to imagine what their life will be like in 10 years
- 12) Statement 1: Some people think that planning things out in advance is a waste of time
- BUT
- Statement 2: Other people think that things work out better if they are planned out in advance
- 13) Statement 1: Some people like to take big projects and break them down into small steps before starting to work on them
- BUT
- Statement 2: Other people find that breaking big projects down into small steps isn't really necessary
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me
- Statement 1 is Really True for Me
 Statement 1 is Sort of True for Me
 Statement 2 is Sort of True for Me
 Statement 2 is Really True for Me

14) Statement 1: Some people take life one day at a time without worrying about the future

BUT

Statement 2: Other people are always thinking about what tomorrow will bring

- Statement 1 is Really True for Me
- Statement 1 is Sort of True for Me
- Statement 2 is Sort of True for Me
- Statement 2 is Really True for Me

15) Statement 1: Some people think it's better to run through all the possible outcomes of a decision in your mind before deciding what to do

BUT

Statement 2: Other people think it's better to make up your mind without worrying about things you can't predict

- Statement 1 is Really True for Me
- Statement 1 is Sort of True for Me
- Statement 2 is Sort of True for Me
- Statement 2 is Really True for Me

Su	Mo	Tu	We	Th	Fr	Sa
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5
6	7	8	9	10	11	12

Day 90 • February 10th, 2022



1.) How many standard drinks did you have?



Beer = 12 oz.
Wine = 5 oz.
Liquor = 1 - 1.5 oz.

2.) Over how many **hours** were you drinking (from the first drink you had to your last)?



3.) Place a check mark next to all substances that you used on this day



- Sedatives, Hypnotics, or Anxiolytics
- Cannabis
- Synthetic Cannabis
- Stimulants
- Opioids
- Hallucinogens
- Phencyclidine and Related Substances
- Other



4.) How many partners did you engage in oral, anal, or vaginal sex with?

1

For the FIRST partner you had sex with on this day, was this the first time you had sex with this partner?



Yes No

What was the date of this first time you had sex with this partner? (YYYY-MM-DD)

Was this person a casual, regular, or new sex partner? (Casual is someone that you haven't known for very long and have little commitment to. Regular is someone you've known for awhile and have some commitment to. New is someone you had sex with for the first time.)

New
 Casual
 Regular

What was the gender of this partner?

Male
 Female

What was this partner's STD status?

Positive
 Negative
 Don't Know

Which of the following sexual activities did you engage in with this partner...

Oral Sex (giving or receiving)?

Yes No

Vaginal Sex?

Yes No

Did you use a condom during this act?

Yes No

Anal Sex?

Yes No

Was a condom easily accessible during this sexual encounter?

Yes No

What was the context/situation/environment that led to engaging in sexual activity?

- A date
- A frat party
- A house party
- A bar/restaurant
- A pre-determined meetup for sex (e.g., bootycall)
- A casual hangout
- A get-together with friends
- An exchange of monetary compensation or goods for sex
- Other

On a scale of 0 = not intoxicated at all to 100 = the most intoxicated I have ever been, how intoxicated were you during this sexual encounter?

56

2

3

4

Appendix E. Qualitative In-Depth-Interview Guide

I. INTRODUCTION

Now, I am going to ask you more questions regarding condom use. The goal of this portion of the interview is to get your opinion about what factors you believe influence condom use.

Before we get started, I'd like to review several important reminders:

- 1) You do not need to respond to any questions you don't feel comfortable answering
- 2) There are no right or wrong answers

Do you have any questions before we get started? Okay, let's get started then!

II. PERCEPTIONS ABOUT CONDOM USE

During the portion of the interview where we filled out the calendar together, you said on (**insert date of most-recent *condom-protected* sexual event**) you engaged in sexual activity *with* a condom.

- A. What do you think contributed to using a condom on that day?
- B. Was there anything unique about this sexual encounter that led to you using a condom?

III. PERCEPTIONS ABOUT CONDOM NON-USE

During the portion of the interview where we filled out the calendar together, you said on (**insert date of most-recent *condomless* sexual event**) you engaged in sexual activity *without* a condom.

- A. What do you think contributed to not using a condom on that day?
- B. Was there anything unique about this sexual encounter that led to you not using a condom?

IV. PERCEIVED DIFFERENCE BETWEEN CONDOM-PROTECTED & CONDOMLESS SEX EVENTS

- A. What are some of the primary differences between the two sexual events we just discussed that influenced using a condom during one event but not the other?
- B. What do you think are the most common reasons why you do not use a condom?

V. PERCEPTIONS ABOUT CONDOM USE WITH ALCOHOL CONSUMPTION

[If alcohol use or other substance has not been discussed ask the following questions]

- A. What role do you think alcohol plays in whether you use or do not use a condom?
- B. How important is alcohol in the equation of whether or not a condom is used during sex?
 1. What factors play a greater role in whether you use a condom?
 2. What factors play a lesser role in whether you use a condom?

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PEER-REVIEWED PUBLICATIONS

1. **Sheinfil, A. Z.**, Foley, J., Moskal, D., Dalton, M., Firkey, M., ... & Woolf-King, S. E. (In Press). Daily associations between alcohol consumption and ART adherence among HIV-positive men who have sex with men. *AIDS and Behavior*. doi: 10.1007/s10461-022-03657-x
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13. **Sheinfil, A. Z.**, Giguere, R., Dolezal, C., López-Rios, J., Iribarren, S., Brown III, W... & Carballo-Diéguez, A. (2020). Information and motivation predict HIV-serostatus among a population of high-risk men and transgender women who have sex with men. *AIDS and Behavior*, 24(10), 2863-2871.
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27. Brown III, W., Giguere, R., **Sheinfil, A.**, Ibitoye, M., Balán, I., Ho, T., ... & Carballo-Diéguez, A. (2018). Challenges and solutions implementing an SMS text message-based survey CASI and adherence reminders in an international biomedical HIV PrEP study (MTN-017). *Journal of Biomedical Informatics*, 80, 78-86.
28. Giguere, R., Rael, C. T., **Sheinfil, A.**, Balán, I. C., Brown, W., Ho, T., ... & Lama, J. R. (2018). Factors supporting and hindering adherence to rectal microbicide gel use with receptive anal intercourse in a phase 2 trial. *AIDS and Behavior*, 22(2), 388-401.
29. Iribarren, S. J., Ghazzawi, A. *, **Sheinfil, A. Z.** *, Frasca, T., Brown, W., López-Rios, J., ... & Carballo-Diéguez, A. (2018). Mixed-method evaluation of social media-based tools and traditional strategies to recruit high-risk and hard-to-reach populations into an HIV prevention intervention study. *AIDS and Behavior*, 22(1), 347-357.
*authors contributed equally to the work
30. Giguere, R., Brown III, W., Balán, I. C., Dolezal, C., Ho, T., **Sheinfil, A.**, ... & Carballo-Diéguez, A. (2017). Are participants concerned about privacy and security when using short message service to report product adherence in a rectal microbicide trial? *Journal of the American Medical Informatics Association*, 25(4), 393-400.
31. Rael, C. T., **Sheinfil, A.**, Hampanda, K., Carballo-Diéguez, A., Pala, A. N., & Brown, W. (2017). Examining the unique characteristics of a non-probability sample of undocumented female sex workers with dependent children: The case of Haitians in the Dominican Republic. *Sexuality & Culture*, 21(3), 680-691.

32. Rael, C. T., Carballo-Diéguez, A., Norton, R., Thorley, E., Giguere, R., **Sheinfil, A.**, & López-Rios, J. (2016). Identifying strategies to cope with HIV-related stigma in a group of women living with HIV/AIDS in the Dominican Republic: A qualitative study. *AIDS and Behavior*, *21*(9), 2589-2599.

MANUSCRIPTS SUBMITTED FOR PUBLICATION

1. **Sheinfil, A. Z.**, & Woolf-King, S. E. (under review). Development of an affect induction procedure to elicit affective arousal and valence.
2. Ramos, J., **Sheinfil, A.**, Firkey, M., Foley, J., Marabella, G., & Woolf-King, S.E. (under review). Coping with emerging adult and sexual and gender minority stress and alcohol use among US college students.
3. Febo, I., Cruz-Torres, C., Crespo, R., Giguere, R., López-Rios, J., ... & Carballo-Diéguez, A. (under review). Opportunities for HIV prevention among men who have sex with men and transgender women at high risk of infection in Puerto Rico.
4. Gjoka, M., Firkey, M., **Sheinfil A.**, & Woolf-King, S.E. (revise and resubmit). The association between condom use self-efficacy and condom-decision abdication among college students: A brief report.

PROFESSIONAL PRESENTATIONS

Listed in reverse chronological order

1. Ramos, J., Firkey, M., **Sheinfil, A. Z.**, Dalton, M. R., & K. S. J. Andrews. (2022, March). Transgender minority stress and alcohol use among college students: The role of coping motives. Poster presented at the annual meeting of the Society of Behavioral Medicine, Baltimore, MD.
2. Scheer, J., Edwards, K., **Sheinfil, A.**, Dalton, M., Firkey, M., & Watson, R. (2021, May). Interpersonal victimization, substance use, and mental health among sexual and gender minority youth: The role of cognitive mechanisms. Poster presented at the annual meeting of the National LGBTQ Health Conference, virtual conference.
3. Dalton, M. R., Ramos, J. M., Firkey, M., **Sheinfil, A. Z.**, & Gjoka, M. (2021, May). Distal gender minority stress and depression: The indirect effect of relational support. Poster presented at the National LGBTQ Health Conference, virtual conference.
4. Marabella, G., Firkey, M., **Sheinfil, A.**, & Woolf-King, S.E. (2021, April). The Impact of social desirability bias on alcohol use among black and white men who have sex with men living with HIV. Poster presented at the annual meeting of the Society of Behavioral Medicine, virtual conference.
5. Firkey, M., **Sheinfil, A.**, & Woolf-King, S.E. (2021, April). College students' general well-being, substance use, and sexual behavior as a function of geographic region during COVID-

19. Poster presented at the annual meeting of the Society of Behavioral Medicine, virtual conference.
6. Firkey, M., **Sheinfil, A.**, Ramos, J., & Woolf-King, S.E. (2020, June). Unprotected anal intercourse and combined alcohol and cannabis use among men who have sex with men living with HIV: An event-level analysis. Poster presented at the annual meeting of the Research Society on Alcoholism, New Orleans, LA.
 7. Ramos, J., **Sheinfil, A.**, Firkey, M., Simmons, E., & Woolf-King, S. E. (2020, June). Coping motives as a moderator of the association between minority stress and alcohol use among college students of marginalized sexualities and genders. Poster presented at the annual meeting of the Research Society on Alcoholism, New Orleans, LA.
 8. Rael, C., Giguere, R., Lentz, C., López-Rios, J., Brown III, W., ... & Carballo-Diéguez, A. (2019, July). Transgender women's experiences using a home HIV testing kit for self- and partner-testing. AIDS Impact 14th International Conference, London, United Kingdom.
 9. Balán, I., López-Rios, J., Giguere, R., Cruz-Torres, C., Dolezal, C., ... & Carballo-Diéguez, A. (2019, July). Then we looked at his results: What happens when a partner's HIV self-test result is positive? AIDS Impact 14th International Conference, London, United Kingdom.
 10. Brown III, W., López-Rios, J., **Sheinfil, A.**, Frasca, T., Cruz-Torres, C., ... & Carballo-Diéguez, A. (2019, July). Text messaging and disaster preparedness aids engagement, re-engagement, retention, and communication among Puerto Rican participants in an HIV self-testing study after hurricanes Irma and Maria. AIDS Impact 14th International Conference, London, United Kingdom.
 11. Brown III, W., Febo, I., **Sheinfil, A.**, López-Rios, J., Giguere, R., Dolezal, C., ... & Carballo-Diéguez, A. (2019, November) Using daily text message-based short message service computer-assisted self-interview (SMS-CASI) to measure sexual risk behavior in a randomized controlled trial of HIV self-test use to screen potential sexual partners. Poster presented at the annual meeting of the American Public Health Association, Philadelphia, PA.
 12. **Sheinfil, A. Z.**, Foley, J. D., Ramos, J. M., & Woolf-King, S. E. (2019, March). Development of an experimental affect induction procedure to test the effect of affect on intentions to engage in condomless sex. Poster presented at the annual meeting of the Society of Behavioral Medicine, Washington, D.C.
 13. Babowitch, J.D., **Sheinfil, A. Z.**, Ramos, J. M., Firkey, M. K., & Woolf-King, S. E. (2019, March). Changes in depressive symptoms and antiretroviral medication adherence among men who have sex with men living with HIV. Poster presented at the annual meeting of the Society of Behavioral Medicine, Washington, D.C.
 14. **Sheinfil, A. Z.**, Loitsch, A., Babowitch, J. D., Muyindike, W., Kusasira, A., Emenyonu, N., Hahn, J., & Woolf-King, S. E. (2018, June). Alcohol-related barriers to condom use among

people living with HIV in rural Uganda: A qualitative analysis. *Alcoholism: Clinical and Experimental Research*, Vol. 42, No. 6, June 2018.

15. Babowitch, J. D., **Sheinfil, A. Z.**, Ramos, J., Vanable, P. A., & Sweeney, S. M. (2018, April). Pre-exposure prophylaxis to prevent HIV transmission for serodiscordant couples: Perspectives of people living with HIV. Poster presented at the annual meeting of the Society of Behavioral Medicine, New Orleans, LA.
16. **Sheinfil, A. Z.**, Loitsch, A., Siedle-Khan, B., Maisto, S. A., & Woolf-King, S. (2017, June). Preliminary reactions to brief acceptance and commitment therapy for alcohol use among HIV-infected men who have sex with men (MSM). *Alcoholism: Clinical and Experimental Research*, Vol. 41, No. 6, June 2017.
17. Dolezal, C., Rael, C., Balán, I., Giguere, R., Leu, C. S., Brown III, W., ... & Carballo-Diéguez, A. (2016, October). The association between sexual behavior and acceptability of oral PrEP and a rectal microbicide gel to prevent HIV transmission. In *AIDS Research and Human Retroviruses* (Vol. 32, pp. 377-377).
18. Brown III, W., Giguere, R., **Sheinfil, A.**, Balan, I., Ibitoye, M., Dolezal, C., ... & Carballo-Diéguez, A. (2016, October). Feasibility and acceptability of an international SMS text message-based adherence and survey system in a biomedical HIV prevention study (MTN-017). In *AIDS Research and Human Retroviruses* (Vol. 32, pp. 386-386).
19. Rael, C., **Sheinfil, A.**, Hampanda, K., & Brown III, W. (2016, October). Depression and health consciousness in undocumented female sex workers: The case of Haitians in the Dominican Republic. Poster session presented at the meeting of the American Public Health Association (APHA), Denver, CO.

RESEARCH EXPERIENCE

Syracuse University, Psychology and Health Laboratory, Syracuse, NY

Graduate Research Assistant

2016 - 2018

Supervisor: Dr. Sarah E. Woolf-King, Ph.D., M.P.H.

Project Title: Alcohol Use and High Risk Behavior Among HIV-Positive Men

(NIAAA K01AA021671-06, PI: Woolf-King).

Selected Responsibilities: Act as a project coordinator recruiting potential participants; conduct longitudinal data-collection study sessions; train participants in the use of an interactive voice response (IVR) daily diary; manage a daily diary database; maximize participant retention; conduct qualitative in-depth interviews; harmonize a quantitative database; code transcripts for qualitative data-analysis; manuscript preparation and submission.

Syracuse University, Psychology and Health Laboratory, Syracuse, NY

Graduate Research Assistant

2019 - 2021

Supervisors: Dr. Sarah E. Woolf-King, Ph.D., M.P.H.; Dr. Stephen A. Maisto, Ph.D.

Project Title: Brief Acceptance and Commitment Therapy for HIV-Infected At-Risk Drinkers

(NIAAA R34AA026246-01A1, PIs: Woolf-King, Maisto)

Selected Responsibilities: Adapt an Acceptance and Commitment Therapy treatment manual; conduct qualitative in-depth interviews with HIV health-care providers, code transcripts for qualitative data-analysis; act as an interventionist on a pilot-randomized clinical trial delivering two types of brief-interventions for alcohol reduction to people with HIV; manuscript preparation and submission; prepare NIH grant submission materials.

Syracuse University, Alcohol Research Laboratory, Syracuse, NY

Graduate Research Assistant

2020 - 2021

Supervisors: Dr. Stephen A. Maisto, Ph.D., Dr. Tibor P. Palfai, Ph.D., Dr. Jeffrey Simons, Ph.D.

Project Title: Alcohol and Implicit Process in Sexual Risk Behavior in Men who have Sex with Men

(NIAAA R01AA022301; PIs: Maisto, Palfai, Simons)

Selected Responsibilities: Coordinate activities for a multi-site study; train and supervise undergraduate and graduate research personnel; recruit, screen, and conduct laboratory protocols (including alcohol administration); conduct clinical interviews; code qualitative responses; train participants to use Ecological Momentary Assessment data collection software and monitor survey completion, manuscript preparation and submission.

Syracuse University, Department of Psychology, Syracuse, NY

Graduate Research Assistant

2017 - 2021

Supervisor: Dr. Stephen A. Maisto, Ph.D.

Project Title: Working Toward Efficacious Preventive Interventions for Alcohol-Related HIV/AIDS

(NIAAA U13AA024987, PI: Maisto)

Selected Responsibilities: Assist in the organization and implementation of the Intersection of Alcohol & HIV Risk-Behavior Conference; prepare conference materials and invitations; coordinate conference proceedings; disseminate conference research findings; develop and maintain conference website.

Medical University of South Carolina, College of Nursing, Charleston, SC

Clinical Interventionist

2019 -

Supervisor: Dr. Tracy Stecker, Ph.D.

Project Title: CBT by Phone to Promote Use of Alcohol Related Care and Reduce Drinking

(NIAAA R01AA026815-01, PIs: Conner, Stecker)

Selected Responsibilities: Act as an interventionist on a randomized clinical trial delivering a brief cognitive-behavioral telehealth intervention designed to encourage at-risk drinkers to engage in alcohol use disorder treatment.

New York State Psychiatric Institute and Columbia University, HIV Center for Clinical and Behavioral Studies, New York, NY

Research Assistant

2014 - 2016

Supervisor: Dr. Alex Carballo-Diéguez, Ph.D.

Project Titles: MTN-017: A Phase 2 Randomized Sequence Open Label Expanded Safety and Acceptability Study of Oral Emtricitabine/Tenofovir Disoproxil Fumarate Tablet and Rectally-Applied Tenofovir Reduced-Glycerin 1% Gel; Rapid Home Test to Reduce Sexual Risk

Behavior in MSM and Transgender Women *(NICHD R01HD076636-05, PI: Carballo-Diéguez)*

Selected Responsibilities: Recruit, screen, and conduct data-collection sessions with men and transgender women who have sex with men at high-risk for HIV; code transcripts for qualitative data-analysis; manage a daily diary database; harmonize quantitative databases; conduct quantitative and qualitative data-analyses; manuscript preparation and submission; prepare NIH grant submission materials.

CUNY Queens College, Applied Behavior Analysis Laboratory, Flushing, NY

Research Assistant

2013 - 2014

Supervisor: Dr. Bruce L. Brown, Ph.D.

Project Title: Direct Replication of Angrilli et al. (1997).

Selected Responsibilities: Conduct data-collection sessions for a study examining perception of time; manage multiple databases; quantitative data-analysis; maintain Institutional Review Board protocols; present research findings at a poster session.

CLINICAL EXPERIENCE

McGovern Medical School, Changing Lives through Autism Spectrum Services, Houston, TX

Psychology Intern

March, 2022 – July, 2022

Supervisors: Dr. Katherine Loveland, Ph.D.

Role: Deliver evidence-based interventions for patients with autism spectrum disorder and co-morbid conditions in both an individual and group format. Conduct neuropsychological assessments (including Autism Diagnostic Observation Schedule – 2 [ADOS-2]) with adults suspected to meet diagnostic criteria for autism spectrum disorder.

McGovern Medical School, UTHealth Trauma and Resilience Center, Houston, TX

Psychology Intern

November, 2021 – March, 2022

Supervisors: Dr. Leslie Taylor, Ph.D., Dr. Jennifer Hughes, Ph.D.

Role: Deliver evidence-based, trauma-focused care for patients struggling with complex trauma, post-traumatic stress disorder (PTSD) and trauma-related behavioral health conditions via telemedicine. Psychotherapeutic treatments include Prolonged Exposure Therapy, Cognitive Processing Therapy, and Written Exposure for veterans, first responders (e.g., police, firefighters, EMT), and elder mistreatment or abuse survivors.

McGovern Medical School, UTHealth Harris County Psychiatric Center, Houston, TX

Psychology Intern

July, 2021 – November, 2021

Supervisor: Dr. Ana Ugueto, PhD, ABPP

Role: Deliver brief evidence-based individual therapies and psychological assessments as a member of the psychological services team on the adult and child and adolescent units. Facilitate group treatment with an emphasis on cognitive-behavioral techniques on the child and adolescent unit in an inpatient psychiatric hospital. Administer psychodiagnostic assessment interviews for initial admissions and score, analyze, and synthesize results into a brief report that is used to inform treatment. Develop safety plans and conduct relapse prevention with children, adolescents, and adults.

SUNY Upstate Medical University Hospital, Concussion Management Program, Syracuse, NY

Student Clinician

September, 2020 – June, 2021

Supervisor: Dr. Brian Rieger, Ph.D.

Role: Provide individual psychotherapy using evidence-based treatments in a rehabilitation psychology department to adolescents and adults who suffer from traumatic brain injuries and dementias with co-occurring mental and behavioral health concerns.

SUNY Upstate Medical University Hospital, Addiction Psychiatry Service, Syracuse, NY
Student Clinician March, 2020 – August, 2020

Supervisor: Dr. Brian Johnson, MD

Role: Conduct psychological assessments, intake evaluations, and deliver twice-weekly transference-focused psychotherapy with individuals presenting with substance use disorders and co-occurring psychiatric conditions. Participate as a member of a multidisciplinary treatment team that includes a focus on detoxification, abstinence maintenance, and psychotropic medication management in an outpatient addiction clinic.

SUNY Upstate Medical University Hospital, Psychiatry High-Risk Program, Syracuse, NY
Prescreening Coordinator 2019 – 2020

Supervisor: Dr. Robert Gregory, MD

Role: Administer psychodiagnostic assessment interviews for Borderline Personality Disorder (BPD) that include: Structured Clinical Interview for BPD, suicide risk assessment, substance use history, a measure of verbal intelligence (i.e., Peabody Picture Vocabulary Test), and a decision-making task (Iowa Gambling Task). Assist in the development and refinement of safety plans with individuals at high risk for suicide. Score, analyze, and synthesize results into a brief report that is reviewed by the patient and therapist.

Syracuse University, Psychological Services Center, Syracuse, NY
Student Clinician 2018 – 2019

Supervisors: Drs. Afton Kapuscinski Ph.D., Nina Stoeckel, Ph.D., Joseph Himmelsbach Ph.D.

Role: Provide individual therapies in a university-based outpatient training facility to adults with diverse psychiatric conditions. Conduct clinical/neuropsychological assessments (e.g., ADHD assessment) with adults, adolescents, and children.

TEACHING EXPERIENCE

Guest Lecturer, Health Psychology, “*Affect and Sexual Risk Behavior*”, Fall 2018

Guest Lecturer, Health Psychology, “*HIV: Epidemiology, Transmission, Treatment, & Prevention*”, Summer 2018

Undergraduate Teaching Assistant, Psychology of Personality, Spring 2014

ADDITIONAL TRAINING / PROFESSIONAL WORKSHOPS

Prolonged Exposure Therapy Workshop 2021
Instructor: Brook Fina, LCSW, BCD - Strong Star Training Initiative

Cognitive Processing Therapy Workshop 2021
Instructor: Katherine Dondanville, PsyD, ABPP - Strong Star Training Initiative

Multilevel Modeling Workshop, Syracuse University 2017

Instructor: Holly Laws, Ph.D.

Meta-Analysis Methods Workshop, Syracuse University 2017

Instructor: Lori Scott-Sheldon, Ph.D.

Safer People, Safer Spaces Interactive Allyship Development Training 2017

Sponsored by: Syracuse University, LGBTQ Resources Center

HIV Testing in New York State Certification Course 2015

Sponsored by: New York State Department of Health AIDS Institute

PROFESSIONAL MEMBERSHIP

Psi Chi Honor Society Member, Queens College Chapter 2014 -

Graduate Student Member, Psychology Action Committee, Syracuse University 2016 -

Student Member, Society of Behavioral Medicine (SBM), HIV And Sexual Health
Special Interest Group 2018 -