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(Safe) sex on my mind: the effects of a safe sex prime and an alcohol prime on sex-related perceptions and behavior

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**"(Safe) Sex on My Mind: The Effects of a Safe Sex Prime and an Alcohol Prime on Sex-related Perceptions and Behavior"**

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- Each author has contributed significantly to the work and agrees to the submission.
- No conflict of interest exists.

## **Abstract**

**Objective:** Previous research suggests that exposure to alcohol primes (i.e., stimuli associated with alcohol) affects drinkers' perceptions and behaviors. The present study investigated the effects of an environmental alcohol prime (being in a simulated bar setting) and a safe sex message prime (a public health safe sex message) on sexually-active alcohol drinkers.

**Method:** Participants (n = 80) were assigned to one of four conditions according to priming allocation and engaged in a simulated video chat with a potential partner. They reported their sex-related self-perceptions and perceptions of a potential partner upon procedural completion. **Results:** The alcohol-related environmental prime led participants to rate their potential partner as being significantly less inhibited and more sexual. The safe sex message significantly reduced reported sex-related self-perceptions and perceptions of their partners' disinhibition. There was a significant effect of primes on participants' perceptions of their partner's friendliness - participants exposed to either or both prime(s) perceived their partner as being friendlier than participants exposed to no prime.

**Conclusions:** Results suggest that environmental alcohol primes may strengthen sexually active drinkers' perceptions of a potential partner's disinhibition and sexuality even before alcohol consumption begins, and that a safe sex message may moderate these effects. The presence of safe sex messages in alcohol-related environments may positively influence sexual risk decision making among sexually-active drinkers.

## Introduction

Despite health promotion and awareness campaigns aiming to reduce the spread of sexually transmitted diseases (STDs), infection rates amongst young adults continue to be a public health concern. In 2019, there was a 5% increase from the previous year, and the impact of STDs remains greatest in young heterosexuals (15 to 24 years) (PHE, 2019). In the United States it is estimated that individuals aged 15-24 account for half of the new sexually transmitted infections that occur each year (CDC, 2021). Relatedly, heavy alcohol consumption is prevalent in this population: such drinking has been found to be a common occurrence amongst university students (Wechsler et al., 2000) with one in five male and one in ten female US first-year university students reporting consumption levels twice the recommended threshold over a two-week period (White et al., 2006). Additionally, it has been reported that attendees in genitourinary medicine (GUM) clinics for STDs in the United Kingdom are assessed with high levels of binge drinking (with 86% exceeding government binge drinking levels of six units) (Standerwick et al., 2007). Although it is often recognised that alcohol use may be a contributing factor in sexual risk-taking behaviors (see Morris & Albery, 2001; Cooper, 2002; 2006), evidence of causation is lacking.

Models which have been proposed to explain alcohol's causative role in sexual risk-taking include an expectancy model which incorporates psychological expectations and beliefs (see Goldman et al., 2006), and an impairment model which suggests that the pharmacological effects of alcohol include a myopic-type impairment of individuals' cognitive processes (alcohol myopia; Steele & Josephs, 1990). Inconsistent empirical support for this model led to the development of a model which integrates expectancy and myopia to suggest that environmental stimuli in a situation involving alcohol may activate expectancies temporarily,

even before alcohol has been consumed, and affect subsequent reactions (Moss & Albery, 2009). For example, for a sexually-active alcohol drinker who, based on previous experience, associates alcohol use with sexual activity, relevant stimuli in the forms of primes in the environment may trigger alcohol use-related sexual expectancies (e.g., enhancement, disinhibition, risk; Dermen & Cooper, 1994). This may affect and guide an individual's subsequent perceptions and behaviors and affect sexual risk decision making even before alcohol has been consumed.

The expectancy of disinhibition (the belief that alcohol consumption will weaken inhibitions) has been found to have a significant relationship with binge drinking in a sample of university students (Carlson et al., 2010). More recent research amongst university students found that aspects of *sex-related* alcohol expectancy of disinhibition (specifically, reduced *sexual inhibitions* due to alcohol use) was related to appraisals of negative consequences resulting from combining sex and alcohol (Johnson et al., 2018). In this sample, as levels of reduced inhibitions increased, appraisals of negative outcomes resulting from sexual activity under the influence of alcohol decreased. Adding to this, disinhibition expectancies affected individuals' self-efficacy for sexual protection such that the stronger a drinker's expectancies that alcohol will weaken sexual inhibitions, the weaker their belief of their capability to protect themselves from STDs.

For sexually-active drinkers, being in an alcohol-related environment may therefore activate related expectancies and influence subsequent sex-related reactions and behaviors.

However, studies have found both reckless (unsafe) and prudent (safer) sexual risk intentions to follow alcohol consumption depending on the salience of environmental primes in the situation (e.g., MacDonald et al., 2000). This suggests that the presence of a

prime to promote safe sex intentions may affect sexually-active drinkers in an alcohol-related situation to form safer sex intentions. It is therefore useful to examine the influence of alcohol-related contexts along with safe sex targeted messages on individuals who may be at risk of engaging in potentially harmful sex behaviors.

Past research examining the influence of alcohol on sexual risk taking has often included methodologies utilising written and visual hypothetical scenarios (e.g., Abbey et al., 2000; MacDonald et al., 1996; Friedman et al., 2005; George et al., 2006; Davis et al., 2007). For instance, after exposure to alcohol primes, males with strong expectancies of alcohol's positive effects on sexual desire rated women as more attractive (Friedman, et al., 2005). Although such studies produced robust evidence, ecological validity has been limited as participants were typically aware of the hypothetical nature of the experiments and experimental procedures were usually conducted in generic laboratory environments. Such labs, not specifically designed to simulate actual alcohol-related locations (such as a pub or bar) may therefore elicit different cognitive responses than in a more realistic environment (see Moss, et al., 2015, for results of a simulated-bar lab study). Additionally, these previous studies have typically relied on cognitive measures, with little or no measures of interpersonal behavioral outcomes.

Alcohol-related features of the environment have been shown to have priming influences (Albery et al., 2015). Drinking establishments (i.e., bars and pubs) contain a rich and complex range of alcohol-related primes, and will be heavily associated with previous drinking experiences in the same or similar environments. In line with this, being in bars and pubs has been shown to affect expectancies relative to non-alcohol contexts. For instance, Wall et al. (2000) tested situation-specific primes and alcohol expectancies in a sample of

undergraduate drinkers and found that participants exposed to bar-related primes reported stronger expectancies of disinhibition than did participants in a generic lab environment.

Monk and Heim (2013) examined environmental primes on university students' expectancies and found that positive outcome expectancies related to social activities were stronger in participants tested in a bar environment than in a university lecture theatre.

More recent research (Moss et al., 2015) found that the amount of drinking in a simulated bar environment was significantly greater than in a generic lab, but strikingly there was a significant increase in consumption amongst undergraduate students exposed to responsible drinking messages (i.e. the messages had the opposite of the intended effect).

Additionally, the use of technology to meet a potential partner has become widespread over the last two decades (Finkel et al., 2012) and has been linked to sexual risk taking (Couch & Liamputtong, 2007). An exploratory study of dating site users (Hobbs et al., 2017) concluded that the use of technology in seeking partners has provided individuals with greater capabilities in their pursuits. A focus group study of adolescents (Van Ouytsel et al., 2016) found that respondents reported greater ease of conversing with potential partners via technology rather than face-to face. Thus, how participants behave in a more ecologically valid context, and when they expect a real interaction with a potential partner via technology, remains important gaps in the evidence base regarding the link between alcohol-related environments and sexual risk-taking factors.

### *The Present Research*

The interaction between safe sex primes and alcohol primes has yet to be investigated, to our knowledge. University students and young adults have been identified as having multiple sexual partners while using condoms inconsistently (e.g., Mosher et al., 2005), and

the trend of engaging in excessive alcohol consumption amongst these populations has been documented (Johnston et al., 2011). Therefore, the current study aimed to assess the effects of an alcohol-related prime and a safe sex-related prime on relevant cognitive and behavioral outcomes amongst sexually-active alcohol drinkers in a university population. Participants engaged in a video chat on a computer with a pre-recorded series of messages by someone that could be considered as a potential partner. The effects of being in a simulated bar environment on sexually-related cognitions and behavior, and the interaction of such effects with the presentation of a safe sex message prime were examined to assess the potentially moderating effect of exposure to a safe-sex message on these links.

We predicted that: 1) participants exposed to an alcohol prime would exhibit stronger sex-related perceptions and related behaviors than those not exposed to the alcohol prime; 2) participants exposed to the safe sex prime would exhibit reduced reported sex-related perceptions than those not exposed to the safe sex prime; and 3) the effects of the alcohol prime on perceptions and behaviors would be reduced or eliminated when safe sex primes are simultaneously presented. and 4) there would be an effect of the primes on a behavioral measure of proximity.

## **Method**

### **Participants**

Sixty-seven female (83.8% of sample) and thirteen male (16.3%) sexually-active alcohol drinkers were recruited from a university in London, UK. They participated in return for research participation credits. A sample size of  $N = 80$  was deemed to be sufficient utilising G\*Power 3.1.9.2 (Faul, et al., 2009) given an alpha value of 0.05 and power of 0.80, in order to assess medium to large effects. Additional power analyses using SPSS version 28 showed

that given an alpha value of 0.05 and power of 0.25, a sample size of  $N = 27$  per each of the two prime conditions (total  $N = 54$ ) would be sufficient. Seventy-four (92.5%) identified as heterosexual and six (7.5%) as bisexual. Thirty-seven (46.3%) identified as White, twenty-two (27.5%) as Black, nine (11.3%) as Asian, and twelve (15.0%) as 'Other'. For relationship status, thirty-five (43.8%) responded as being single and forty-five (56.2%) as not being single. The mean age of participants was 26.04 years ( $SD = 7.83$  years, range 18 - 49).

## Design

A 2 x 2 between groups design was employed with participants randomly assigned to conditions, although participants were allocated according to gender to ensure there was a balanced spread amongst the conditions. The independent variables consisted of alcohol prime (bar lab room vs. non-bar lab room), and safe sex prime (safe sex message vs. no message). Demographic questionnaires were completed before the experimental procedure while dependent variable measures were completed after exposure to the primes.

Participants were allocated to a specific condition to ensure an equal distribution of gender and relationship status per condition. No significant differences were found in the distributions (gender: alcohol prime condition,  $X^2(1, N = 67) = 2.30, p = 0.13$ ; safe sex prime condition,  $X^2(1, N = 67) = 0.83, p = 0.36$ ) and (relationship status: alcohol prime condition,  $X^2(1, N = 45) = 0.46, p = 0.50$ ; safe sex prime condition,  $X^2(1, N = 67) = 1.27, p = 0.26$ ).

## Measures

### *Demographic information*

Information about respondents' gender, age, ethnicity, sexual orientation, relationship status, and alcohol consumption (AUDIT-C; Bush et al., 1998) was collected.

### *Measures for sexuality, friendliness, disinhibition, sexual behavior and sexual attraction*

Items were adopted from Abbey et al.'s (2000) to measure these outcome variables.

Responses were rated on a seven-point scale (1 = *not at all* to 7 = *very much*). For each measure, participants were first asked questions regarding themselves, followed by the same questions regarding their video chat partner.

Participants rated themselves (Cronbach's  $\alpha = .73$ ) and their video partner ( $\alpha = .71$ ) on each of six adjectives regarding *sexuality*: flirtatious, sexy, seductive, promiscuous, romantic, and attractive. For *friendliness*, participants rated themselves ( $\alpha = .74$ ) and their video partners ( $\alpha = .75$ ) on each of seven adjectives: friendly, cheerful, kind, likable, sincere, sociable, and warm. For *disinhibition*, participants rated themselves ( $\alpha = .73$ ) and their video partners ( $\alpha = .73$ ) on six adjectives: uninhibited, expressive, confident, outgoing, impulsive, and silly.

Participants were asked four questions about their own *sexual behavior* towards their video chat partner ( $\alpha = .73$ ), followed by the same four questions about how they perceived their video partner's *sexual behavior* towards them ( $\alpha = .73$ ). The questions asked how much you and your partner 'flirted', 'came on to', 'wanted to be seduced', and 'behaved in a sexual manner'.

Participants were asked four questions about their *sexual attraction* to their video partner ( $\alpha = .73$ ), followed by the same four questions about how they perceived their video partner's *sexual attraction* to them ( $\alpha = .74$ ). The questions asked about 'sexual attraction', 'interest in dating', 'being receptive to a sexual advance', and 'interest in having sex' toward the respective individual.

### *Relationship Status*

Following ethics panel advice, we included relationship status as a variable in the present study to assess its influence on the dependent variables.

### *Behavioral measure of proximity*

In order to measure interpersonal behavioral outcomes (participants' behavior in a more ecologically valid context, expecting a real interaction with a potential partner), the distance that the participants placed his/her chair from the chair of his/her video chat partner was measured in millimetres (similar to Word et al., 1974).

### *Video chat recordings*

Video recordings were created separately with a female student actress and a male university student. There were two scripts (see Appendix) utilised in the experiment – one for the female video actor clip which male participants viewed and another version with a male video actor which was viewed by female participants. Both versions of the script were worded exactly the same. During the experimental procedure, participants were informed that they would be engaging in a video chat exchange on a computer. The video clip display was controlled remotely by the primary experimenter throughout the interaction in order to ensure that the pre-recorded clips were precisely advanced after each participant had responded to the questions they were asked in each clip.

### **Procedure**

Participants completed the initial questionnaire (demographics and alcohol consumption questions) before the experimental procedure was initiated. Participants who responded in the initial questionnaire as having consumed alcohol in the previous 12 hours were breathalysed using a Lion 600 Alcometer to ensure that their blood alcohol concentration

(BAC) was 0mg/l units per ml. None of the breathalysed participants exhibited a BAC level above zero.

Participants sat in front of a computer monitor either in the bar-lab (alcohol prime condition; see Figure 1) or in a generic lab room (non-alcohol prime condition) and were told that they would be engaging in a video chat with a member of the opposite sex who they would meet after video chat completion (due to ethics panel advice, single participants were told that this would be a 'live' video exchange discussion with the person in the video chat with whom they interacted, while non-single participants were informed of the hypothetical nature of the video and subsequent discussion). Each participant was either exposed to/not exposed to a safe sex message prime, according to assigned condition, in the form of an A4 size poster (from [www.health.nsw.gov.au](http://www.health.nsw.gov.au); see Figure 2) that was located directly to the right of the computer monitor throughout the entire video interaction.

The experiment was conducted in a laboratory located within a university psychology department in the United Kingdom. The laboratory included a purpose-built bar specifically created to resemble a typical pub environment, featuring a 4.5-m bar, optics, bar taps, bottles, barstools, and appropriate wall decoration (see Figure 1). Participants assigned to an alcohol prime condition were tested in this bar lab.

INSERT FIGURE 1 HERE

INSERT FIGURE 2 HERE

Once the simulated video chat discussion was complete, the participant was given a questionnaire containing the dependent variable measures. Following this, the participant entered a room where a stack of two chairs had been placed at a specific location at a

distance of 650 mm from another single chair, facing each other. The single chair had a scarf and jacket placed on it, identical to that which the actor had been wearing during the simulated discussion, in order to strengthen ecological validity. The researcher asked the participant to enter the room and to take the top chair off of the stack and place it wherever he/she wished in order to engage in a discussion with the individual in the video chat interaction, and the experiment ended. The distance between the front chair legs (of the participant's chair and potential partner's chair) was measured by the researcher using a standard tape measure, as a behavioral dependent variable measure of proximity.

The post-experimental phase began with a funnelled debrief to check for suspicion about the simulation (see Bargh & Chartrand, 2000). No participants were excluded as a result of their responses. Finally, participants re-signed the consent form to reconfirm their willingness for participation and use of their data.

### Manipulation Check

During the debrief, single participants were asked two questions with response choices 1 (not at all) - 4 (very much) on a likert scale (mean scores are shown): 'How much were you expecting to meet the person in the webcam chat?' (N = 34, M = 3.22) and 'How much were you surprised that the person in the webcam chat was not there to actually meet you?' (N = 34, M = 3.18).

### **Results**

To examine the effects of the alcohol prime and safe sex message prime, two 2 x 2 MANCOVA analyses were conducted on the dependent variables of sexuality, sexual behavior, sexual attraction, friendliness, and disinhibition (lack of inhibitions), and proximity

behavior (physical social distance). The first tested the effects of the primes on participants' self-perception dependent variables and the second tested the effects of the primes on the dependent variables for the participants' perceptions of their video chat interaction partner.

### AUDIT scores

All participants reported being alcohol drinkers. There was no significant difference of AUDIT total scores amongst the four conditions,

$F(3, 76) = 0.52, p = 0.67$ . This indicates that participants' overall drinking habits did not have a significant effect on the dependent variable measures.

### Descriptive statistics of sample and bivariate correlations for DVs

Descriptive statistics of participants are shown in Table 1: means, standard deviations, and ranges of scores for variables of self-perceptions and partner perceptions for all participants.

INSERT TABLE 1 HERE

Bivariate correlations for all DVs are shown in Table 2.

INSERT TABLE 2 HERE

### Self-perception variables

Results showed a significant multivariate main effect of the safe sex prime on participants' self-perceptions during the video chat, Wilks'  $\lambda = .83, F(5, 64) = 2.70, p = 0.03, \eta_p^2 = 0.17$ . No significant multivariate effects were found for the alcohol prime ( $F(5, 64) = 0.67, p = 0.65$ ), the alcohol prime x sex prime interaction ( $F(5, 64) = 0.42, p = 0.84$ ), nor for relationship

status ( $F(5, 64) = 0.31, p = 0.91$ ). Univariate results are displayed in Table 3 and accompanying descriptive statistics are shown in Table 4.

INSERT TABLE 3 HERE

The safe sex prime had significant effects on participants' perceptions of their own sexuality, sexual behavior, friendliness, and disinhibition. Participants exposed to the safe sex message reported weaker self-perceptions for each of these variables than did participants not exposed to the message.

INSERT TABLE 4 HERE

#### Perceptions of partner variables

Results for the effects of the primes on participants' perceptions of their video chat partner revealed a significant multivariate main effect of the alcohol prime: Wilks'  $\lambda = .82, F(5, 56) = 2.54, p = 0.04, \eta_p^2 = 0.19$ , and of the safe sex prime: Wilks'  $\lambda = .76, F(5, 56) = 3.62, p = 0.007, \eta_p^2 = 0.24$ . No significant multivariate effects were found for the alcohol prime and safe sex prime interaction ( $F(5, 56) = 2.07, p = 0.08$ ), or for relationship status ( $F(5, 56) = 0.73, p = 0.60$ ). The MANCOVA univariate results are displayed in Table 5.

INSERT TABLE 5 HERE

For the univariate results, participants exposed to the alcohol prime reported significantly stronger perceptions of their video chat partner's sexuality and disinhibition than participants not exposed to the alcohol prime. Participants exposed to the safe sex prime reported significantly weaker perceptions of their video chat partner's sexuality than participants not exposed to the safe sex prime. Means and standard deviations are displayed in Table 6.

INSERT TABLE 6 HERE

There was a significant interaction of the alcohol prime and safe sex prime on participants' perceptions of their video chat partner's friendliness during the interaction,  $F(1, 60) = 9.00$ ,  $p = 0.004$ ,  $\eta_p^2 = 0.13$  with participants exposed to either or both prime(s) perceiving their partner as being more friendly than participants exposed to no prime. There was also a significant interaction of the alcohol and safe sex prime on participants' perceptions of their video chat partner's disinhibition during the interaction,  $F(1, 60) = 4.20$ ,  $p = 0.04$ ,  $\eta_p^2 = 0.07$ , such that participants exposed to only the alcohol prime perceived their partner as being more disinhibited (less inhibited) than participants exposed to the safe sex prime only, both primes together, or to no prime. Means and standard deviations for significant interaction effect results are displayed in Table 7.

INSERT TABLE 7 HERE

#### *Behavioral measure of physical social distance / proximity*

No significant effects were found for the alcohol prime ( $p = .59$ ) or safe sex prime ( $p = .57$ ) or their interaction ( $p = .22$ ) on the behavioral dependent variable of physical proximity (the distance at which participants placed their chair in order to have a verbal interaction with their video chat partner).

#### *Participants' relationship status (single vs not single)*

In all analyses, participants' relationship status (single vs. not single) was included as a covariate but had no significant effect on the dependent variables (all  $ps > .05$ ).

## **Discussion**

Studies have shown that alcohol-related primes may activate related expectancies and influence subsequent behaviors. The present study extended previous findings by examining the effects of an environmental alcohol prime and a safe sex message prime on sexually-active drinkers' self-perceptions and perceptions regarding a potential partner. It was predicted that participants exposed to an alcohol prime would exhibit stronger sex-related perceptions and behavior than those not exposed to an alcohol prime. This hypothesis was partially supported as the alcohol prime (being in a bar environment) had a significant effect on participant's perceptions of their video chat partner but not on their self-perceptions. Participants assessed their video chat partner as being significantly more sexual and less inhibited in the bar environment conditions. This finding supports previous research which suggests alcohol-related environments may affect related expectancies (Wall et al., 2000; Monk & Heim, 2013). It may be that this effect is driven by sexually-active drinkers perceiving bar environments to be establishments in which others go to lose inhibitions and seek a sexual partner.

Although the two primes had clear impact on expectancies, no significant effects were found-regarding the indirect measure of proximity - the distance at which participants placed their chair in order to have a verbal interaction with their video chat partner. Future research could explore behavioral reactions in order to test the influence of them on their effects on the intention-behavior relationship (see Baban & Craciun, 2007). The current study did not assess behavioral responses after alcohol consumption, so further research should explore the intention-behavior link involving alcohol use to investigate how expectancies such as disinhibition may affect related outcomes it is possible that behavioral effects will be more pronounced when actual alcohol is consumed (due in part to alcohol myopia).

It was also predicted that participants exposed to a safe sex prime would exhibit weaker sex-related perceptions and behavior than those not exposed to a safe sex prime. There were significant effects of the safe sex message on the participants' assessments of their *own* sexuality, (comprising sexual behavior, lack of inhibitions, and friendliness) with participants rating themselves as having significantly weaker self-perceptions after exposure to the safe sex message prime. This provides evidence that safe sex messages in the form of written and pictorial representations (i.e. the safe sex message poster in this experiment – see Figure 2) may have the desired effect to reduce sexual perceptions and possibly sexual risk taking in potentially sexual situations with new partners. This supports previous research such as a community-level intervention which included placement of safe sex messages in sex-related establishments which had a significant effect of reducing unsafe sex amongst individuals aged 18–29 years (Godin et. al., 2008).

There was a significant interaction between primes for partner's lack of inhibitions such that participants in the bar context condition (with alcohol prime exposure), but without the safe sex message, rated their partner as much less inhibited than those participants who participated in the chat in a non-alcohol environment lab room *or* in the presence of the safe sex prime. This suggests that alcohol-orientated environments may influence sexually-active drinkers to perceive potential partners as lacking inhibitions; however, when a safe sex message is also present in an alcohol context situation, it may weaken or negate these effects. Our study also found that the presence of the safe sex message weakened participants' perceptions of disinhibitions relative to the alcohol prime alone. This may signify that having safe sex posters in alcohol establishments (or potentially on relevant social media sites) may help to reduce sexual risk-taking intentions, supporting previous research which found that when inhibiting primes are made salient (e.g., 'don't be

reckless'), intoxicated participants exhibited more cautious reactions (MacDonald, et al., 2000). The inclusion of a safe sex message in a relevant context may have preventative power related to perceptions of disinhibition and therefore preconsumption alcohol myopia (see Moss & Albery, 2009) by interacting with and weakening the influence of an alcohol prime. It has been suggested that future behavior change interventions would benefit by promoting implementation intentions (if-then plans) which are activated by such situational cues to elicit related behaviors automatically (e.g., Brandstätter et al., 2001; Gollwitzer, 1993; Sheeran et al., 2005; see Webb, & Sheeran, 2006). The continuation of the effect of the safe sex prime after alcohol consumption begins is an important one to address in future research aiming to reduce sexual risk-taking affected by alcohol.

Adding to this, participants who viewed the video chat in the bar without the safe sex message perceived their partner as being much less inhibited than participants in the other three conditions. This finding provides evidence that an alcohol environment may influence sexually-active drinkers to perceive potential partners in this situation as lacking inhibitions even prior to actual consumption. However, importantly, when the safe sex message was present in the bar context conditions, the reported perceptions of disinhibition were essentially on parity with those in the non-bar, safe sex condition.

Regarding perceptions of their video chat partner's friendliness, participants who viewed the video chat in the non-alcohol context lab room and without the safe message, perceived their partner as being less friendly than in the other three conditions in which one or both prime(s) was/were present. This evidence suggests that alcohol environments and safe sex messages may induce perceptions of friendliness about others, perhaps by provoking thoughts of social interactions and related factors, such as the sex-related alcohol

expectancies of enhancement and disinhibitions (i.e. activating associations about sexuality and lack of inhibitions by others; see Dermen & Cooper, 1994). However, the safe sex message prime weakened participants' perceptions of their *own* friendliness, unlike their perceptions of others' friendliness. It is interesting that the safe sex message weakened participants' *self-perceptions* of both friendliness *and* sex-related factors, which may be related to sexual scripts in the context of social interactions (see Simon, 2017, and Kimmel, 2007, for reviews of sexual scripts). The pictorial representation in the safe sex message used in this experiment (see Figure 1) may evoke perceptions of friendliness of others due to specific details in the picture (i.e. smiling faces of other people), but may have the opposite effect of activating a competing self-concept value related to safe sex and inhibitions (see Verplanken & Holland, 2002, for a review of value activations on behavioral decision making).

#### *Limitations and Future Research*

The current study did not assess responses after alcohol consumption, so further research should explore the intention-behavior link involving alcohol use to investigate how expectancies such as disinhibition may affect related outcomes it is possible that behavioral effects will be more pronounced when actual alcohol is consumed (due in part to alcohol myopia).

Future research may also benefit from examining gender and sexual orientation differences. For example, previous research found a misperception effect regarding the way men perceive women's behavior by focusing on potentially sexual primes when making decisions about sexually availability and possible sexual advances (Abbey et al., 2000). Additionally, research amongst sexually-active young women has found that both egalitarian and

traditional attitudes are associated with higher rates of risky sexual behavior while moderate gender attitudes are associated with safer sex (Leech, 2010). The current study included a high number of female participants relative to male participants and future studies should seek a more balanced gender ratio in order to determine any gender effects. Regarding sexual orientation, rates of STDs such as HIV are generally higher among homosexual males than other populations and these individuals may therefore exhibit different sensitivities to safe sex messages. Future research may also benefit from the inclusion of more homogeneous participant samples (e.g., similar drinking habits, sexual experience, etc.) in order to examine these effects more appropriately.

Assessing the influence of technology beyond computer use, such as utilising smartphones and related social interaction apps (e.g., Tinder and Grindr), on which sexually-active drinkers use to communicate, may help to elucidate the effects interpersonal perceptions amongst potential sexual partners. Since the use of technology to meet a potential partner has increased considerably over the last two decades (Finkel et al., 2012) and has been linked to sexual risk taking (Couch & Liamputtong, 2007), further experimental research regarding technological outlets is warranted. Research has shown that young adults regard safe sex content on such apps to be an acceptable form of sexual health promotion (Holloway et. al., 2014; Huang et al., 2016).

### *Implications*

As sexual risk-taking and related effects continue to lead to deleterious outcomes, it is important to investigate associated contributing factors such as alcohol. The current study sought to examine how an alcohol environment and a safe sex message would influence variables related to sexual risk taking. Our findings suggest that for individuals who consume

alcohol and who are sexually active, an association between alcohol environments and sex may be formed so that simply being in a related environment, such as a bar, may trigger sex-related cognitions which affect subsequent self-perceptions and those of potential partners (potentially through computer-oriented interactions). In our experiment, results suggest that individuals located in an alcohol environment perceive potential partners to be more sexual and less inhibited even before alcohol consumption begins. However, the presence of a safe sex message in the alcohol environment had the effect of weakening these perceptions, and also a general pervasive effect of weakening self-perceptions related to sex. Our findings suggest that safe sex messages located in alcohol-related environments, may therefore help to reduce sexual risk-taking cognitions in sexually-active drinkers before alcohol consumption begins.

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**Table 1****Descriptive statistics of sample of participants for all DVs**

	Self-perceptions				Partner perceptions			
	N	Range	Mean	SD	N	Range	Mean	SD
<b>Sexuality</b>	78	1.00 – 5.83	2.39	1.23	79	1.00 – 6.00	3.07	1.31
<b>Sexual Behavior</b>	75	1.00 – 3.50	1.47	0.66	78	1.00 – 6.25	2.28	1.21
<b>Sexual Attraction</b>	79	1.00 – 5.75	1.97	1.21	78	1.00 – 5.75	2.45	1.23
<b>Friendliness</b>	80	2.43 – 6.86	4.93	1.02	75	3.43 – 7.00	5.25	0.88
<b>Disinhibition</b>	79	1.50 – 6.67	3.83	1.09	73	1.33 – 6.50	4.09	1.01

**Table 2****Bivariate correlations for all DVs***Correlations Amongst Dependent Variables*

Variables	1	2	3	4	5	6	7	8	9	10
1. Self Sexuality	--	.53**	.20	.49**	.48**	.61**	.32**	.22	.04	.22
2. Self Sexual Behavior		--	.33**	.17	.29*	.58**	.65**	.41**	-.06	.20
3. Self Sexual Attraction			--	.17	.20	.52**	.46**	.52**	.23*	.40**
4. Self Friendliness				--	.73**	.24*	.11	.22	.39**	.33**
5. Self Disinhibition					--	.33**	.36**	.41**	.33**	.42**
6. Partner Sexuality						--	.59**	.37**	.31**	.53**
7. Partner Sexual Behavior							--	.63**	.12	.30*

8. Partner Sexual Attraction	--	.09	.17
9. Partner Friendliness	--		.61**
10. Partner Disinhibition			--

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

**Table 3**

**MANCOVA univariate results for self-perception dependent variables**

Variable	Alcohol prime			Safe sex prime			Interaction		
	<i>F</i>	<i>p</i>	$\eta_p^2$	<i>F</i>	<i>p</i>	$\eta_p^2$	<i>F</i>	<i>p</i>	$\eta_p^2$
<i>Sexuality</i>	1.66	0.20	.024	9.24	.003**	0.12	0.10	0.75	.002
<i>Sexual Behavior</i>	0.09	0.76	.001	7.46	0.008***	0.10	0.15	0.70	.002
<i>Sexual Attraction</i>	0.11	0.75	.002	2.84	0.10	0.04	0.45	0.50	.007
<i>Friendliness</i>	1.31	0.26	.019	4.63	0.04*	.064	0.10	0.92	.000
<i>Disinhibition</i>	1.24	0.27	.018	4.38	0.04*	0.06	0.87	0.36	.013

Note: For all tests,  $dfs = 1, 68$ . \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 4**

*Means and standard deviations (in parentheses) for results of participants' self-perception dependent variables*

	Prime condition		Prime condition	
	Alcohol prime	No alcohol prime	Safe sex prime	No safe sex prime
<b>Sexuality</b>	2.49 (1.29)	2.15 (1.03)	1.90 (0.72)	2.70 (1.37)
<b>Sexual</b>	1.44 (0.73)	1.48 (0.60)	1.24 (0.37)	1.66 (0.78)
<b>Behavior</b>				
<b>Sexual</b>	1.96 (1.25)	1.81 (1.12)	1.62 (1.02)	2.13 (1.39)
<b>Attraction</b>				
<b>Friendliness</b>	5.00 (1.02)	4.73 (1.00)	4.60 (1.03)	5.11 (0.95)
<b>Disinhibition</b>	3.85 (0.95)	3.59 (1.10)	3.46 (1.13)	3.96 (0.87)

Table 5

*MANCOVA univariate results for perception of partner dependent variables*

Variable	Alcohol prime			Safe sex prime			Interaction		
	<i>F</i>	<i>p</i>	$\eta_p^2$	<i>F</i>	<i>p</i>	$\eta_p^2$	<i>F</i>	<i>p</i>	$\eta_p^2$
<i>Sexuality</i>	7.80	0.007**	0.12	13.21	0.001***	0.18	3.00	0.09	.048
<i>Sexual Behavior</i>	0.01	0.94	.000	0.91	0.34	.015	0.60	0.44	.010
<i>Sexual Attraction</i>	0.17	0.68	.003	2.18	0.15	.035	0.03	0.86	.001
<i>Friendliness</i>	1.70	0.20	.03	0.29	0.59	.005	9.00	0.004**	0.13
<i>Disinhibition</i>	3.99	0.05*	.062	1.64	0.21	.027	4.28	0.04*	.067

Note: For all tests, *dfs* = 1, 60. \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

Table 6

*Means and standard deviations (in parentheses) for results of participants' perceptions of potential partners on the dependent variables*

	Alcohol prime condition		Safe sex prime condition	
	Alcohol prime	No alcohol prime	Safe sex prime	No safe sex prime
<b>Sexuality</b>	3.30 (1.20)	2.67 (0.97)	2.58 (0.90)	3.43 (1.20)
<b>Sexual Behavior</b>	2.51 (1.21)	2.18 (1.08)	2.04 (1.08)	2.31 (1.19)
<b>Sexual Attraction</b>	2.38 (1.11)	2.24 (1.13)	2.11 (1.13)	2.53 (1.06)
<b>Friendliness</b>	5.32 (0.95)	5.10 (0.80)	5.27 (0.96)	5.12 (0.76)
<b>Disinhibition</b>	4.27 (1.00)	3.86 (0.91)	3.94 (1.04)	4.19 (0.87)

Table 7

*Means and standard deviations (in parentheses) for significant interaction results of participants' perception of partner dependent variables*

	<b>Alcohol prime only</b>	<b>Safe sex prime only</b>	<b>Alcohol + Safe sex primes</b>	<b>No prime</b>
<i>Friendliness</i>	5.60 (0.71)	5.45 (0.84)	5.08 (1.07)	4.71 (0.53)
<i>Disinhibition</i>	4.70 (0.49)	3.96 (0.93)	3.91 (1.17)	3.75 (0.89)

**Figure 1**

***Alcohol prime – lab bar***



*Note: these are not actual participants*

**Figure 2**

***Safe sex message poster prime***



NSW HEALTH

Anyone can get infected  
condoms

Sexually transmitted infections (STIs) do not discriminate. They can affect anybody who has unsafe sex. Infection rates of STIs such as syphilis, chlamydia and HIV are on the rise. Don't be shame with an infection - contact your local Aboriginal Medical Service, doctor, health worker or sexual health clinic. Use a condom - it's your best protection against infection.

1800 008 669 [www.health.nsw.gov.au](http://www.health.nsw.gov.au) **Safe Sex. No Regrets.**

## Appendix

There were two scripts (see example below) utilised in the experiment – one for the female video actor (called ‘Sue’) clip which male participants viewed and another version with a male video actor (called ‘Sam’) which was viewed by female participants. Both were worded exactly the same.

Female (F): **Hi, my name’s Sue.**

**What’s your name?**

*Participant responds*

F: **Hi, nice to meet you.**

**I’m 20 and from London.**

**How old are you and where are you from?**

*Participant responds*

F: **Oh, nice.**

**So, in my free time, I like to hang out with my friends and talk and listen to music.**

**I sometimes go out on weekends if I’m not too busy.**

**I prefer hanging out in cafes and having nice conversations.**

**Do you go out very much and what do you like to do in your free time?**

*Participant responds*

F: **Okay, nice.**

**So, I'm single and looking now.**

**I think my ideal first date would be to go to a cafe and have a coffee or juice and hang out and stuff.**

**What is your idea of an ideal date?**

*Participant responds*

**F: Yeah, that sounds nice.**

**Well it's been nice chatting to you and I hope you enjoyed it too and I'm looking forward to meeting you in person in a few minutes and having a coffee or juice with you.**