

1-5-2010

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Grainne Cousins

Royal College of Surgeons in Ireland, gcousins@rcsi.ie

Hannah McGee

Royal College of Surgeons in Ireland

Richard Layte

Royal College of Surgeons in Ireland

Citation

Cousins G, McGee H, Layte R. Suppression effects of partner type on the alcohol-risky sex relationship in young Irish adults. *Journal of Studies on Alcohol and Drugs*. 2010;71(3):357-65.

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Suppression Effects of Partner Type on the Alcohol–Risky Sex Relationship in Young Irish Adults*

GRÁINNE COUSINS, PH.D.,[†] HANNAH MCGEE, PH.D., AND RICHARD LAYTE, PH.D.[†]

Department of Psychology, Division of Population Health Sciences, Royal College of Surgeons in Ireland, 123 Stephen's Green, Dublin 2, Ireland

ABSTRACT. Objective: The present study examined the link between alcohol consumption and condom use, testing whether partner type suppresses the effects of alcohol consumption on condom use. This study also sought to determine whether the effects of alcohol on condom use during casual sex remain after adjusting for condom-use intentions and planning or preparatory behaviors, such as having a condom available. **Method:** A retrospective, cross-sectional study design was used. A subset of participants ages 19-30 years from the national Irish Study of Sexual Health and Relationships were recontacted ($n = 388$). Telephone interviews regarding participants' most recent sexual event in their normal social environment (i.e., not on holidays) were conducted ($n = 362$). Partnership type was defined as "just met," "casual," or "steady." Men comprised 51% of the sample. The mean age was 23.9 years. **Results:**

Both alcohol consumption and condom use were more common in casual sexual events than steady sexual events. In addition, partnership type was found to suppress the effects of alcohol consumption on condom use, such that the relationship between alcohol consumption and condom use became significant and negative only after controlling for partner type. Furthermore, the negative effects of alcohol consumption on condom use during casual sex remained after adjusting for condom-use intentions and planning. **Conclusions:** These findings illustrate the complexity of the relationship between alcohol consumption and condom use, highlighting the importance of contextual factors such as partner type. Furthermore, the effects of alcohol on condom use during casual sex cannot be explained by the fact that such events tend to be more spontaneous and less planned. (*J. Stud. Alcohol Drugs*, 71, 000-000, 2010)

HIV IS A GLOBAL HEALTH PROBLEM, causing an estimated 25 million deaths worldwide since 1981. Globally, there are an estimated 33 million (30.3-36.1 million) people living with HIV (UNAIDS, 2008). In addition to HIV, there are more than 30 bacterial, viral, and parasitic pathogens that are transmissible sexually (Holmes et al., 1999). Such sexually transmitted infections present a major public health problem, imposing an enormous burden of morbidity and mortality, through their impact on sexual and reproductive health. The World Health Organization (2007) estimates that approximately 340 million new cases of curable sexually transmitted infections occur annually, with millions of viral sexually transmitted infections also occurring.

Although condom use represents an effective means of prophylaxis (De Vicenzi, 1994; Holmes et al., 2004; Weller and Davis, 2002), rates of consistent condom use among heterosexual adolescents and adults remain low. For example, a national U.K. study reported that less than 25% of adults ages 16-44 years used condoms consistently (Johnson et al.,

2001). Bryan et al. (2002) reported similar findings in their study of American college students, with only 35% of students reporting consistent condom use (Bryan et al., 2002). A Canadian study of single heterosexual adults also reported that around one third of young adults do not systematically use condoms (Godin et al., 2005).

Conventional wisdom identifies alcohol consumption as a likely cause of risky sex. It is widely accepted that alcohol "provokes the desire..." (Macbeth, II; iii) and reduces one's reasoning ability (Steele and Josephs, 1990). However, available evidence would suggest that the influence of alcohol consumption on sexual risk taking continues to elude definitive scientific understanding, because studies have generally produced contradictory effects (George and Stoner, 2000). George and Stoner asked, "Is alcohol capable of exerting an authentically causative influence on sexual responses and outcomes?" (p. 92). Furthermore, "if alcohol is capable of causal influence, is this causation robust, systematic and subject to coherent descriptions and rational explanations?" (p. 93). Experimental evidence suggests that alcohol has a causative influence on certain sexual responses, particularly condom-use intentions, condom-use attitudes, and risk perceptions (Abbey et al., 2005; MacDonald et al., 1996, 2000). However, experimental studies cannot guarantee a causal influence of alcohol on condom-use behavior because of necessary ethical and practical constraints of the laboratory paradigm. Critical incident and multiple event methodologies have the potential to compensate for the lack of experi-

Received: June 26, 2009. Revision: November 3, 2009.

*The research was funded by Health Research Board grant RP/2005/8. The authors also acknowledge the Department of Health and Children and the Crisis Pregnancy Agency who commissioned the national Irish Study of Sexual Health and Relationships, which allowed us to conduct this follow-up study.

[†]Correspondence may be sent to Gráinne Cousins at the above address or via email at: gcousins@rcsi.ie. Richard Layte is with the Economic and Social Research Institute, Dublin, Ireland.

mental evidence regarding behavioral effects. Such studies have sought to establish a temporal link between alcohol consumption and condom use as a necessary, although not sufficient, condition for inferring causality. Demonstrating a significant relationship between alcohol consumption and condom use on a given occasion does not prove a causal effect. However, failure to do so would substantially weaken a causal interpretation of this relationship. However, event-specific studies have yielded equivocal results, thus suggesting that the relationship between alcohol consumption and condom use, irrespective of causality, is neither robust nor systematic.

Weinhardt and Carey (2000) argued that any systematic relationship between alcohol and risky sex will be better understood by examining the social context of sexual activity, particularly partner type. Leigh (2002) suggests that alcohol is often an instrument of courtship and, as such, is more prevalent in sexual encounters involving new or casual partners (Brown and Vanable, 2007; Cooper and Orcutt, 2000; La Brie et al., 2005; Vanable et al., 2004).

Cooper and Orcutt (2000) explored a more complex explanation for inconsistent findings regarding the effects of alcohol consumption on condom use, namely that partnership type suppresses the relationship between alcohol consumption and condom use. In their study of 1,306 young adults, suppression was characterized as follows. Although there was a nonsignificant relationship between alcohol consumption and condom use, when partner type was included in the analyses, a larger and significant negative relationship emerged between alcohol consumption and condom use. Suppression is statistically similar to mediation but has some important differences (MacKinnon et al., 2000). Similar to mediation, suppression is quantified by determining the change in the relationship between an independent and a dependent variable associated with the addition of a third variable in the analyses. Contrary to mediation, however, the third variable is expected to increase the magnitude of the relationship between the independent and dependent variables. Furthermore, unlike mediation, a significant relationship between the independent variable and dependent variable is not required.

Although suppression has been interpreted as a third variable removing irrelevant variance in the independent variable in this case, partner type removing irrelevant variance in alcohol consumption, an alternative interpretation of force and counterforce, has been recommended by researchers (MacKinnon et al., 2000; Tzelgov and Henik, 1991). As such, partner type could be exerting an effect in opposition to alcohol's effect on condom use. Alcohol consumption is considered to have a negative effect on condom use. However, drinking proximal to sexual behavior has a positive relationship with casual partnerships, which in turn has a positive relationship with condom use. This is consistent with Cooper and Orcutt's (2000) conclusion that failure to

control for partner type may systematically underestimate the strength of the relationship between alcohol consumption and condom use.

However, it is also possible that alcohol has stronger effects on condom use for casual encounters, because such events—particularly when alcohol is involved—tend to be spontaneous (Brown and Vanable, 2007). Research has consistently shown that being prepared (i.e., having a condom available), discussing condom use with a partner, and agreeing on condom use all increase the likelihood of condom use (Bryan et al., 2002; Hendriksen et al., 2007; Sheeran et al., 1999; Van Empelen and Kok, 2006). Therefore, it is plausible that the negative effect of alcohol consumption on condom use during casual sexual events is a proxy for being unprepared. No studies to date have examined whether the influence of alcohol consumption on condom use during casual sex remains after adjusting for planning or preparatory behaviors. In addition, studies make the assumption—which they never test—that, regardless of alcohol consumption, everyone plans to use a condom but that those plans are thwarted by intoxication at the time of sex (Bryan et al., 2005). Although this may be the case for some, it is also likely that others do not intend to use a condom; therefore, whether they consume alcohol or not, their intentions may be unlikely to change. This highlights the need to examine the influence of alcohol consumption on condom use during casual sex, while controlling for both condom-use intentions and whether a person was prepared to use a condom.

The present study, therefore, hypothesized that partner type suppresses the relationship between alcohol consumption and condom use. A secondary objective was to determine whether the expected negative effects of alcohol consumption on condom use during casual sex remain after adjusting for preparatory behaviors and condom-use intentions.

Method

Original sample

Participants were recruited from the national Irish Study of Sexual Health and Relationships (ISSHR; Layte et al., 2006). ISSHR used a telephone-interview methodology. Random-digit dialing was used to create a sample of telephone numbers for the ISSHR survey, thus allowing for the inclusion of numbers not in the phone directory or recent numbers not yet in the directory. In addition, random-digit dialing allowed for the stratification of numbers within the population, thereby ensuring full coverage of different geographical areas in Ireland. Using the telephone-interview methodology, ISSHR achieved a 61.3% response rate ($N = 7,441$). To improve statistical power for analyses involving younger age groups in ISSHR, individuals younger than age 30 were oversampled ($n = 2,708$).

Current sample

Participants were recontacted for the current study if they agreed to be recontacted, self-identified as heterosexual, were less than 30 years old, and considered themselves to be single (i.e., without a steady partner) when interviewed for ISSHR. These inclusion criteria were applied because young heterosexual adults in less-stable relationships are more likely to be nonmonogamous and interact with a wider number of partners (Abbey et al., 2005; Godin et al., 2005; Rosenthal et al., 1997). By acknowledging that a larger pool of partners increases one's risk of infection from sexually transmitted infections, it was considered important to focus on this group as a potential "at-risk" group.

Seventy-four percent of ISSHR participants fitting the inclusion criteria agreed to be recontacted for future studies ($N = 888$). To determine the representativeness of this potential pool of participants, those fitting all four inclusion criteria were compared with those who fit the inclusion criteria but who declined an invitation for future participation ($n = 305$). No significant differences were observed across sociodemographic profiles, levels of alcohol consumption, condom-use behaviors or experiences of sexual intercourse, or age at first sex. However, a higher proportion of those

with multiple partners in the past 12 months agreed to be recontacted, compared with those who reported fewer than two partners in the past year, $\chi^2(1, n = 1,193) = 4.72$, $p = .03$.

Procedure

A structured telephone interview was conducted. Participant consent was obtained verbally by phone. Recruitment was performed between October 2006 and November 2007. Participants were excluded from the study if they had not had sexual intercourse since ISSHR. Each of the 888 telephone numbers was phoned. A maximum of 10 attempts was made to establish contact with each participant.

Telephone contact was made with 761 of the 888 households, with telephone problems or 10 failed attempts at contact accounting for the remaining 127 participants (Figure 1). Of the households contacted, 251 were not eligible for the following reasons: household refusal, no one in the house fitted the description provided, participant willing to participate but had not had sex in the past 2 years, participant had moved with no new telephone number provided, or participant had died. These results represent a response rate of 76% (388/510).

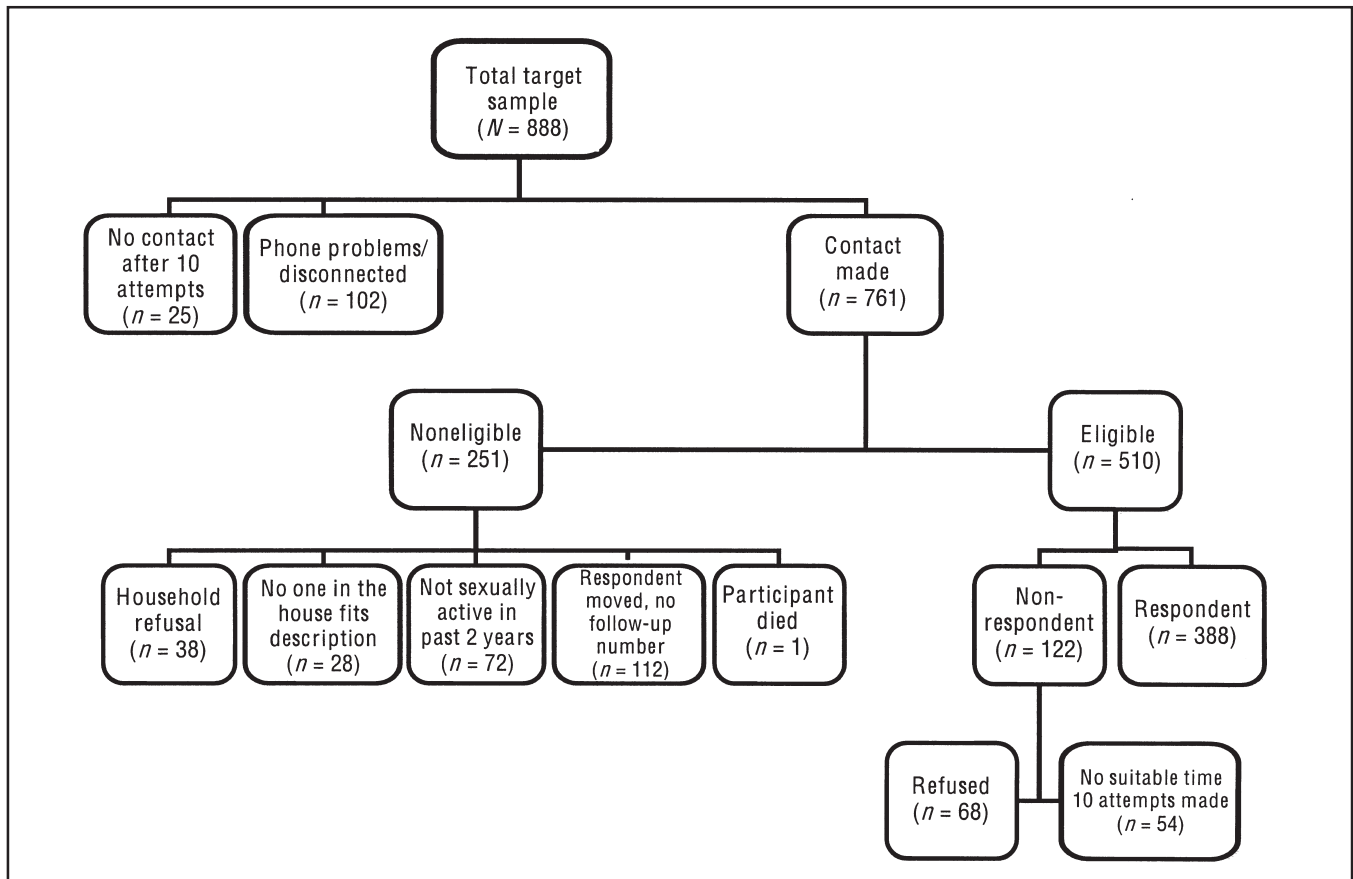


FIGURE 1. Sample recruitment and outcome classification of phone calls ($N = 888$)

Measures

Participants reported on their most recent experience of vaginal intercourse in their normal social environment ($n = 362$). The remaining 26 participants did not have intercourse in their home environment in the past 2 years; rather, they had intercourse only outside their normal social environment, such as when on holidays or away with work or study. This article refers to participants' most recent event in their home or normal social environment.

Partner type. A tripartite measure of partner type was used, wherein participants indicated which of three statements best described their relationship with the person with whom they had sex. Response options included the following: (a) just met for the first time/did not know each other, (b) knew each other but did not have a steady relationship with him or her at this time (casual), or (c) had a steady relationship with this person.

Planning. Four single items were used to measure planning: (a) condom acquisition, (b) condom availability, (c) discussion of condom use with partner, and (d) agreement to use a condom. Condom acquisition was measured in terms of whether the participant bought or obtained a condom before that sexual event. Condom availability was assessed by asking participants to indicate whether a condom was available before intercourse. Discussion was also measured by asking participants if they had discussed whether they would use a condom with this partner. Finally, participants were asked whether they had an agreement with their partner to use a condom. Each of the preparatory behavior variables was dichotomized to represent the individual participant's level of preparedness. These four variables were then summed together, thus resulting in a continuous variable ranging from 0 to 4, wherein 0 indicates no planning and 4 indicates all four behaviors were performed.

Condom-use intentions. Three event-specific measures of intention in action were taken, because they represent participants' intentions as they existed before the performance of the behavior (Ajzen, 1985; Boldero et al., 1992; de Visser and Smith, 2004). Intention items were developed according to Ajzen (2006) and Francis et al. (2004). Participants were asked to think about "when it became clear to you that you might have vaginal sex with this person, on that occasion" and indicate whether they intended/planned/wanted to use a condom. Participants responded on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7).

Alcohol consumption. Participants were asked to indicate if (a) they or (b) their partner had been drinking alcohol before that sexual event. Those participants who reported drinking were asked how many standard drinks they had consumed on that occasion. In line with national (Morgan et al., 2008) and international (Babor et al., 2001) indices of heavy episodic drinking, participants who reported consuming six or more standard alcoholic drinks on that

occasion were classified as engaging in heavy drinking before sex.

Condom use. A single yes/no item was used to measure condom use. Participants who indicated that they did not use a condom during vaginal sex were asked to indicate if they (or their partner, for men) were trying to become pregnant on that occasion using a similar yes/no dichotomous response format.

Statistical analysis

To address the research questions of this study, a series of bivariate and multivariate analyses were performed. Bivariate analyses included cross-tabulations. Multivariate analyses involved hierarchical logistic regression to test the suppression hypothesis and structural equation modeling (SEM) to determine the independent effects of alcohol consumption on condom use during casual sex, after adjusting for condom-use intentions and preparatory behaviors (Mplus 5.1; Muthén and Muthén, 2007).

For SEM, a weighted least square parameter estimate was used, because it is recommended for modeling with binary outcome variables (Muthén and Muthén, 2007). The SEM model was evaluated using indices of best fit. The fit statistics used in this study, as recommended by Kline (2005), included the chi-square model, root mean square error of approximation (RMSEA), and the Bentler comparative fit index (CFI). In relation to the model chi-square, a significant result (cutoff value = .05) indicates a poor fit. The RMSEA estimates the amount of approximation per model degree of freedom, with values less than or equal to .05 indicating close approximate fit (Kline, 2005). Finally, the CFI assesses the relative improvement in fit of the specified model relative to a baseline model. The baseline model refers to the null model, which assumes zero population covariances among the observed variables. A CFI cutoff value greater than .90 is considered adequate for model fit, although values approaching .95 are considered preferable (Hu and Bentler, 1999).

Results

Demographic profile

Three hundred and sixty-two (93%) of the 388 participants were interviewed in relation to their most recent sexual event in their home environment (51% men; 49% women). Participants were, on average, 23.9 years old ($SD = 3.19$; range: 19-32 years).

Participation bias

To rule out error arising from participation bias, the 388 participants were compared with nonparticipants in relation to demographic factors, sexual experiences, and medical

TABLE 1. Proportion reporting drinking, by partner type

Variable	Steady (<i>n</i> = 216)	Casual (<i>n</i> = 146)	Total (<i>n</i> = 362)
Alcohol consumed before sex, %			
Yes	25	70	43
No	75	30	57
No. of standard drinks consumed, <i>M</i> (<i>SD</i>)	7.2 (4.7)	11.5 (6.1)	10 (6.0)
Drinking before sex, %			
0-5 units	86	42	68
≥6 units	14	58	32
Partner consumed alcohol before sex, %			
Yes	25	69	43
No	75	31	57

experiences (using the original ISSHR data set). The 72 participants who had agreed to the interview but had not had sex since ISSHR were excluded from this analysis, thus leaving a comparison group of 428 (total 816). The results showed that the proportion of people interviewed did not vary as a function of demographic or medical factors. Similarly, there were no differences in relation to sexual experience, consistency of condom use, or usual levels of alcohol consumption. However, a higher proportion of participants reporting unprotected sex during their most recent sexual event in ISSHR were interviewed for this study, $\chi^2(1, n = 623)^1 = 5.31, p = .02$.

Partner type, alcohol consumption, preparatory behaviors, and condom use

Five percent of participants reported having a sexual event involving a partner they had just met, 35% reported having a casual sexual event, and 60% reported having a sexual event with a steady partner. Before combining those who reported on a casual and a new sexual event, as is customary in sex research (Brown and Vanable, 2007; Cooper and Orcutt, 2000; Leigh et al., 2008; Van Empelen and Kok, 2006), analyses were conducted to compare the sexual behaviors of both groups during this specific event. There were no differences in their levels of condom use, $\chi^2(1, n = 146) = 0.09, p = .98$; their alcohol consumption before sex, $\chi^2(1, n = 146) = 0.05, p = .82$; or their sexual behaviors: oral sex, $\chi^2(1, n = 146) = 0.98, p = .61$; anal sex, $\chi^2(1, n = 146) = 0.89, p = .35$. There were no gender differences, and men were no more likely than women to report sex with someone they just met, $\chi^2(1, n = 146) = 2.4, p = .12$. Furthermore, 57% of casual events involved a partner of 1 month or less, suggesting a relatively new relationship. A further 25% of casual relationships were no longer than 3 months' duration. In addition, 72% of those reporting on a casual sexual event indicated that this relationship, at the time of sex, was non-exclusive or they were unsure of its exclusivity.

¹This condom-use item measured in ISSHR did not add up to 816 because not all participants had engaged in sexual activity at the time of ISSHR.

Alcohol consumption appears to be common before casual sexual events, with 70% of such events involving alcohol consumption (see Table 1). Not only was alcohol consumption significantly more likely before casual sexual events, $\chi^2(1, n = 362) = 73.0, p < .001$, but casual sexual events were also significantly more likely to involve heavy drinking, $\chi^2(1, n = 362) = 76.9, p < .001$. Furthermore, those reporting on a casual sexual event were also significantly more likely to indicate that their partner had consumed alcohol before sex (Table 1), $\chi^2(1, n = 362) = 68.6, p < .001$. However, condom-use intentions were stronger for those reporting on a casual sexual event than those reporting on a steady event, $t(360) = 5.2, p < .001$. In contrast, participants who reported on a steady sexual event engaged in more preparatory behaviors compared with those reporting on a casual event, $t(360) = 3.6, p < .001$ (Table 2).

Less than two thirds (62%) of participants reported using a condom. None of the nonusers reported that they or their partner were trying to conceive on that occasion. Condom use was significantly more likely during a casual sexual encounter (72%) compared with a steady event (56%), $\chi^2(1, n = 362) = 9.40, p = .002$. In contrast, drinking alcohol before sex was unrelated to condom use, with equal proportions of drinkers (63%) and nondrinkers (62%) reporting condom use. Similarly, the amount of alcohol consumed was unrelated to condom use, with 59% of heavy drinking encounters (six or more drinks) involving condom use compared with 64% of nonheavy episodes, $\chi^2(1, n = 362) = 1.06, p = .3$.

Does partner type suppress the effects of alcohol consumption on condom use?

To test the suppressor hypothesis, a hierarchical logistic regression analysis was conducted. In this analysis, covariates (age, gender, and education) were entered on the first step, followed by amount of alcohol consumed before sex (Step 2) and partner type (Step 3). To the extent that partner type suppresses the alcohol–condom use relationship, controlling for partner type should increase the magnitude of the alcohol effect.

The odds ratio (OR) of heavy drinking proximal to sexual intercourse was 0.82 and nonsignificant ($p = .43$) when entered at Step 2 but was 0.44 and significant ($p = .006$) after entering partner type at Step 3 (Table 3). Furthermore, the addition of partner type at Step 3 contributed significantly to the overall model ($\Delta\text{Model } \chi^2 = 21.0, p < .001$). These findings indicate that, when controlling for covariates and partner type, those who reported heavy drinking were significantly less likely (56% less likely) to report condom use relative to those who did not drink or drank less than six drinks. Similarly, those who reported on a casual sexual encounter were 3.5 times more likely to report condom use, compared with those reporting on a steady sexual encounter.

Figure 2 indicates that a higher proportion of casual

TABLE 2. Condom-use intentions and preparatory behaviors, by partner type

Variable	n items	Casual (n = 146)		Steady (n = 216)	
		M (SD)	Mdn (range)	M (SD)	Mdn (range)
Condom-use intentions	3	5.7 (1.9)	7.0 (1.0-7.0)	4.4 (2.8)	6.0 (1.0 -7.0)
Preparatory behaviors	4	1.85 (1.2)	2.0 (0-4.0)	2.31 (1.2)	2.0 (0-4.0)

TABLE 3. Hierarchical logistic regression analysis modeling the suppressing effects of partner type on the relationship between alcohol consumption and condom use (n = 362)

Step	Model χ^2	Model χ^2	Step 2 OR [95% CI]	Step 3 OR [95% CI]
Step 1: Covariates	15.3**			
Step 2:				
Drinking before sex	15.9**	0.62		
0-5 drinks			ref. ^a	ref. ^a
≥ 6 drinks			0.82 [0.51-1.3]	0.44** [0.25-0.79]
Step 3:				
Partner type	36.9***	21.0***		
Steady				ref. ^a
Casual				3.5*** [2.0-6.3]

Notes: The significance test for the model chi-square provides an indication of whether a given block of predictor variables adds significantly to the model at the point at which it is entered into the equation. Tests of significance reflect contribution after adjusting for covariates, sex, age and education at Step 1. OR = odds ratio; CI = confidence interval. Ref. = reference. ^aThe ref. group is the category against which the other categories were compared.

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

events involved condom use. However, the impact of heavy drinking was greatest for casual events. Casual encounters involving six or more drinks were 71% less likely to involve a condom (OR = 0.29, 95% CI [0.12, 0.66], $p = .003$) than casual events involving lower levels of alcohol consumption. In contrast, the effect of heavy drinking was nonsignificant in relation to steady sexual events (OR = 0.70, 95% CI [0.33, 1.50], $p = .36$).

Having identified the effects of alcohol consumption on condom use during casual sexual encounters, the next step

was to determine whether such effects remain independently significant, after preparatory behaviors and condom-use intentions are taken into account. This model provided an excellent fit to the data, $\chi^2(2) = 2.74$, $p = .25$, CFI = .98, RMSEA = .05. Furthermore, the path from heavy drinking to condom use remained significant, with a probit value of -0.34 ($p = .002$). This indicates that those who reported heavy drinking were significantly less likely to report condom use, regardless of their condom-use intentions and preparatory behaviors.

Discussion

Consistent with international literature from the United States (Aral et al., 2005), Brazil (Calzanas et al., 2005), and Europe (Castilla et al., 1999; Gredig et al., 2006), participants reporting on a casual sexual event in this study were significantly more likely to report using a condom than those reporting on a steady event (72% vs. 56%). Similarly, as hypothesized, alcohol consumption before sex did not have a main effect on condom use. Equal proportions of those who drank reported condom use relative to those who did not drink. Failure to detect a main alcohol effect is consistent with previous event-specific studies (Brown and Venable, 2007; de Visser and Smith 2001a, 2001b; Leigh, 2002; Venable et al., 2004). However, as expected, partner type suppressed the effects of alcohol consumption on condom use, such that controlling for partner type increased

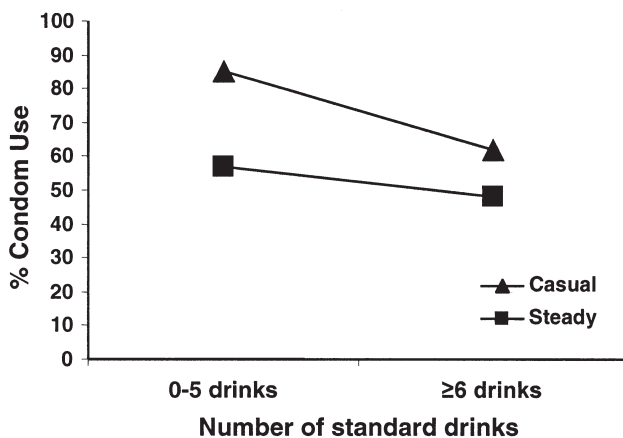


FIGURE 2. Proportion of participants reporting condom use as a function of partner type and amount of alcohol consumed

the magnitude of the negative relationship between alcohol consumption and condom use. These findings are consistent with Cooper and Orcutt's (2000) study of young American adults.

In addition, consistent with previous research, alcohol effects were observed in relation to casual but not steady sexual events (Brown and Vanable, 2007; Corbin and Fromme, 2002; La Brie et al., 2005; Vanable et al., 2004). However, it remains possible that alcohol consumption and casual sex occur coincidentally, given that the places where casual sexual encounters often begin (i.e., pubs and nightclubs) serve alcohol. The opportunity of a casual sexual encounter may present itself unexpectedly, leaving young adults unprepared. Therefore, the availability of condoms in the toilets of pubs and nightclubs is very important, because it allows previously unprepared young adults to acquire a condom on site, thus reducing the likelihood of risky casual sex. However, speculation that negative alcohol effects in this context represent a proxy for lack of preparedness is unfounded. The current study found that the negative effects of heavy alcohol consumption on condom use during casual sex remained after adjusting for planning or preparedness.

The representativeness of the current study findings are supported by the 76% response rate achieved. In addition, the extent to which the study results may have been undermined by participation bias was considered (Bennett and Bozionelos, 2000). Those participants who fit the current study inclusion criteria and agreed to be recontacted were not systematically different from those fitting the criteria but who declined an invitation for future participation. It is important to acknowledge, however, that those willing to be recontacted reported a higher prevalence of multiple partnerships. Similarly, those who were interviewed were similar to those who were not interviewed on a number of demographic and behavioral variables. However, a higher proportion of those interviewed reported unprotected sex in the original ISSHR study. Therefore, it is likely that the current study findings are not generalizable to all young Irish adults but are more meaningful in the context of those young adults at greatest risk of infection.

A further strength of this study was the use of a female interviewer, because research has found that people tend to report more sexual information to female interviewers (Cantania et al., 1996; Fenton et al., 2001). In addition, the likelihood of recall bias is reduced in the current study, because more than 80% of participants reporting on a casual or a steady sexual event reported doing so within 3 months before the interview. Three months has been identified as a reliable time frame for self-reported sexual behaviors (Carey et al., 2001; Jaccard et al., 2002). Furthermore, the study focus on single recent events reduced the cognitive burden of recall, thus providing a reliable index of sexual risk (Brown and Vanable, 2007; Fenton et al., 2001; Schroder et al., 2003a). Examining specific sexual events also allowed for

the identification of a temporal relationship between various contextual factors and condom use.

Several limitations of the present study must also be acknowledged. Studying specific sexual events does not provide sufficient information to determine participants' cumulative risk of infection (Schroder et al., 2003b). In addition, this study combined the "just-met" and "casual" group as a single group, given the lack of differences between casual and new sexual encounters and the general brevity of casual relationships. However, there may be important differences between the two groups that were not measured in the present study, such as number of previous sexual encounters with the partner. Moreover, the possibility of confounding personality effects cannot be eliminated because the present study relied on between-subjects analyses, and personality factors were not measured (Leigh et al., 2008; Trafimow et al., 2004). Furthermore, this study did not account for the effects of other forms of contraception, such as the oral contraceptive pill. A further limitation of this study is the use of self-reported measures of behavior. However, the reliability of self-reported condom use has been established by the use of test-retest reliability analyses and validation of self-reported condom use against sexual partners' reports (Jeannin et al., 1998; Mathias et al., 1999; Van Duynhoven et al., 1999) and seroconversion (De Vincenzi, 1994; Shew et al., 1997). Finally, because this study was cross-sectional, causal direction can be only plausibly inferred.

Notwithstanding these limitations, the current findings have important implications. First, failing to account for the effects of partner type when trying to understand the alcohol-risky sex relationship may result in a Type II error, leading to the erroneous conclusion that alcohol use does not influence whether a person uses a condom. Second, although condom use is the same behavior whether enacted with a casual or steady partner, it was very clear from this study that the contexts are very different, particularly in relation to the role of alcohol consumption. Health promotion campaigns should acknowledge these differences and run partner-specific campaigns. The current study results support a campaign highlighting the potential for unprotected casual sex after drinking heavily. Such a campaign could take the form of television advertisements or poster campaigns in public places, such as colleges, public transport, and bathrooms of public houses and nightclubs. Rather than using ambiguous language, such as "drinking heavily," it may be more appropriate, based on the current findings, to specify an increased risk after six standard drinks—the threshold used in national and international indices of heavy episodic drinking (Babor et al., 2001; Morgan et al., 2008). However, further research is necessary to thoroughly test the effects of specifying a threshold relative to the term *heavy drinking*. Although providing a threshold may allow young adults to personalize their risk, it may also result in less cautious behavior (e.g., failure to carry a condom) among those who

usually drink less or intend to drink less than six standard drinks on a given occasion.

In conclusion, this study brings us one step closer to answering George and Stoner's (2000) question regarding whether the effects of alcohol on condom use are robust. Although this study cannot infer causality, the findings demonstrated a significant negative relationship between heavy drinking and condom use for casual sexual events. More important, these effects remained after adjusting for potential confounders, condom-use intentions, and preparatory behaviors.

References

- Abbey, A., Saenz, C., & Buck, P. O. (2005). The cumulative effects of acute alcohol consumption, individual differences and situational perceptions on sexual decision making. *Journal of Studies on Alcohol*, *66*, 82-90.
- Ajzen, I. (1985). From intention to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behaviour* (pp. 11-39). New York: Springer Verlag.
- Ajzen, I. (2006). Constructing a TPB questionnaire: Conceptual and methodological considerations. Retrieved from www.people.umass.edu/ajzen/pdf/tpb.measurement.pdf
- Aral, S. O., Patel, D. A., Holmes, K. K., & Foxman, B. (2005). Temporal trends in sexual behaviors and sexually transmitted disease history among 18- to 39- year-old Seattle, Washington residents: Results of random digit-dial surveys. *Sexually Transmitted Diseases*, *32*, 710-717.
- Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *AUDIT. The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care* (2nd ed., WHO Document No. WHO/MSD/MSB/01.6a). Geneva, Switzerland: World Health Organization.
- Bennett, P., & Bozionelos, G. (2000). The theory of planned behaviour as predictor of condom use: A narrative review. *Psychology Health and Medicine*, *5*, 307-326.
- Boldero, J., Moore, S., & Rosenthal, D. (1992). Intention, context, and safe sex: Australian adolescents' responses to AIDS. *Journal of Applied Social Psychology*, *22*, 1347-1396.
- Brown, J., & Venable, P. A. (2007). Alcohol use, partner type, and risky sexual behaviour among college students: Findings from an event-level study. *Addictive Behaviors*, *32*, 2940-2952.
- Bryan, A., Fisher, J. D., & Fisher, W. A. (2002). Tests of the mediational role of preparatory safer sexual behavior in the context of the theory of planned behavior. *Health Psychology*, *21*, 71-80.
- Bryan, A., Rocheleau, C. A., Robbins, R. N., & Hutchinson, K. E. (2005). Condom use among high risk adolescents: Testing the influence of alcohol use on the relationship of cognitive correlates of behaviour. *Health Psychology*, *24*, 133-142.
- Calzanas, G., Araujo, T. W., Venturi, G., & Franca, I. J. (2005). Factors associated with condom use among youth aged 15-24 years in Brazil in 2003. *AIDS*, *19* (Suppl. No. 4), S42-S50.
- Cantania, J. A., Binson, D., Canchola, J., Pollack, L. M., Hauck, W., & Coates, T. J. (1996). Effects of interviewer gender, interviewer choice and item wording on responses to questions concerning sexual behaviour. *Public Opinion Quarterly*, *60*, 345-375.
- Carey, M. P., Carey, K. B., Maisto, S. A., Gordon, C. M., & Weinhardt, L. S. (2001). Assessing sexual risk behaviour with the timeline followback (TLFB) approach: Continued development and psychometric evaluation with psychiatric outpatients. *International Journal of STD and AIDS*, *12*, 365-375.
- Castilla, J., Barrio, G., Belza, M. J., & La Fuente, L. (1999). Drug and alcohol consumption and sexual risk behaviour among young adults: Results from a national survey. *Drug and Alcohol Dependence*, *56*, 47-53.
- Cooper, M. L., & Orcutt, H. K. (2000). Alcohol use, condom use and partner type among heterosexual adolescents and young adults. *Journal of Studies on Alcohol*, *61*, 413-419.
- Corbin, W. R., & Fromme, K. (2002). Alcohol use and serial monogamy as risks for sexually transmitted diseases in young adults. *Health Psychology*, *21*, 229-236.
- De Vicenzi, I. (1994). A longitudinal study of human immunodeficiency virus transmission by heterosexual partners. *New England Journal of Medicine*, *331*, 341-346.
- de Visser, R. O., & Smith, A. M. A. (2001a). Inconsistent users of condoms: A challenge to traditional models of health behaviour. *Psychology Health and Medicine*, *6*, 41-46.
- de Visser, R. O., & Smtih, A. M. A. (2001b). Relationship between sexual partners influences rates and correlates of condom use. *Education and Prevention*, *13*, 413-427.
- de Visser, R. O., & Smith, A. M. A. (2004). Which intention? Whose intention? Condom use and theories of individual decision making. *Psychology Health and Medicine*, *9*, 193-204.
- Fenton, K. A., Johnson, A. M., McManus, S., & Erens, B. (2001). Measuring sexual behaviour: Methodological challenges in survey research. *Sexually Transmitted Infection*, *77*, 84-92.
- Francis, J. J., Eccles, M. P., Johnston, M., Walker, A., Grimshaw, J., Foy, R., ... Bonetti, D. (2004). *Constructing questionnaires based on the theory of planned behavior: A manual for health services researchers*. New Castle upon Tyne, UK: Centre for Health Services Research, University of Newcastle. Retrieved from <http://www.rebeqi.org/?pageID=34&ItemID=72>
- George, W. H., & Stoner, S. A. (2000). Understanding alcohol and sexual behavior. *Annual Review of Sex Research*, *11*, 125-157.
- Godin, G., Gagnon, H., Lambert, L. D., & Conner, M. (2005). Determinants of condom use among a random sample of single heterosexual adults. *British Journal of Health Psychology*, *10*, 85-100.
- Gredig, D., Nideroest, S., & Parpan-Blaser, A. (2006). HIV-protection through condom use: Testing the theory of planned behaviour in a community sample of heterosexual men in a high-income country. *Psychology and Health*, *21*, 541-555.
- Hendriksen, E. S., Pettifor, S., Lee, S. J., Coates, T. J., & Rees, H. V. (2007). Predictors of condom use among young adults in South Africa: The Reproductive Health and HIV Research Unit National Youth Survey. *American Journal of Public Health*, *97*, 1241-1248.
- Holmes, K. K., Levine, R., & Weaver, M. (2004). Effectiveness of condoms in preventing sexually transmitted infections. *Bulletin of the World Health Organisation*, *82*, 454-461.
- Holmes, K. K., Mardh, P. A., Sparling, P. F., & Weisner, P. J. (1999). *Sexually transmitted disease* (3rd ed.). New York: McGraw-Hill.
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55.
- Jaccard, J., Wan, C. K., Dittus, P., & Quinlan, S. (2002). The accuracy of self-reports of condom use and sexual behaviour. *Journal of Applied Social Psychology*, *32*, 1863-1905.
- Johnson, A., Mercer, C., Erens, B., & Copas, A. (2001). Sexual behaviour in Britain: Partnerships, practices and HIV risk behaviours. *Lancet*, *358*, 1835-1842.
- Jeannin, A., Konings, E., Dubois-Arber, F., Landert, C., & Van Melle, G. (1998). Validity and reliability in reporting sexual partners and condom use in a Swiss population survey. *European Journal of Epidemiology*, *14*, 139-146.
- Kline, B. (2005). *Principles and practice of structural equation modeling* (2nd ed). New York: Guildford Press.
- LaBrie, J., Earleywine, M., Schiffman, J., Pedersen, E., & Marriott, C. (2005). Effects of alcohol expectancies and partner type on condom use in college males: event-level analyses. *Journal of Sex Research*, *42*, 259-266.

- Layte, R., McGee, H., Quail, A., Rundle, K., Cousins, G., Donnelly, C., ... Conroy, R. (2006). *The Irish Study of Sexual Health and Relationships*. Dublin, Ireland: Crisis Pregnancy Agency and Department of Health and Children.
- Leigh, B. (2002). Alcohol and condom use. A meta-analysis of event-level studies. *Sexually Transmitted Diseases, 29*, 476-482.
- Leigh, B. C., Vanslyke, J. G., Hoppe, M. J., Rainey, D. T., Morrison, D. M., & Gillmore, M. R. (2008). Drinking and condom use: Results from an event-based daily diary. *AIDS and Behavior, 12*, 104-112.
- MacDonald, T. K., Fong, G. T., Zanna, M. P., & Martineau, A. M. (2000). Alcohol myopia and condom use: Can alcohol intoxication be associated with more prudent behavior? *Journal of Personality and Social Psychology, 78*, 605-619.
- MacDonald, T. K., Zanna, M. P., & Fong, G. T. (1996). Why common sense goes out the window: Effects of alcohol on intentions to use condoms. *Personality and Social Psychology Bulletin, 22*, 763-775.
- MacKinnon, D., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science, 1*, 173-181.
- Mathias, S. D., O'Leary, M. P., Henning, J. M., Pasta, D. J., Fromm, S., & Rosen, R. C. A. (1999). Comparison of patient and partner responses to a brief sexual function questionnaire. *Journal of Urology, 162*, 1999-2002.
- Morgan, K., McGee, H., Watson, D., Perry, I., Barry, M., Shelley, E., ... Brugha, R. (2008). *SLÁN 2007. Survey of Lifestyle, Attitudes & Nutrition in Ireland: Main report*. Dublin, Ireland: Department of Health and Children.
- Muthén, L. K., & Muthén, B. O. (1998-2007). *Mplus user's guide* (5th ed.). Los Angeles, CA: Author.
- Rosenthal, D., Smith, A., & de Visser, R. (1997). Young people's condom use: An event-specific analysis. *Venereology, 10*, 101-105.
- Schroder, K. E., Carey, M. P., & Venable, P. A. (2003a). Methodological challenges in research on sexual risk behaviour: I. Item content, scaling and data analytical options. *Annals of Behavioral Medicine, 26*, 104-123.
- Schroder, K. E., Carey, M. P., & Venable, P. A. (2003b). Methodological challenges in research on sexual risk behaviour: II. Accuracy of self-reports. *Annals of Behavioral Medicine, 26*, 104-123.
- Sheeran, P., Abraham C., & Orbell, S. (1999). Psychosocial correlates of heterosexual condom use: a meta-analysis. *Psychological Bulletin, 125*, 90-132.
- Shew, M. L., Remafedi, G. J., Bearinger, L. H., Faulkner, P. L., Taylor, B. A., Potthoff, S. J. & Resnick, M. D. (1997). The validity of self-reported condom use among adolescents. *Sexually Transmitted Diseases, 24*, 503-510.
- Steele, C. M., & Josephs, R. A. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist, 45*, 921-933.
- Trafimow, D., Sheeran, P., Lombardo, B., Finlay, K. A., Brown, J., & Armitage, J. (2004). Affective and cognitive control of persons and behaviour. *British Journal of Social Psychology, 43*, 207-224.
- Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications and applications. *Psychological Bulletin, 38*, 953-958.
- UNAIDS (2008). *2008 Report on the global AIDS epidemic*. Geneva, Switzerland: Joint United Nations Programme on HIV/AIDS.
- Van Duynhoven, Y. T., Nagelkerke, N. J., & Van De Laar, M. J. (1999). Reliability of self-reported sexual histories: Test-retest and inter-partner comparison in a sexually transmitted diseases clinic. *Sexually Transmitted Disease, 26*, 33-42.
- Van Empelen, P., & Kok, G. (2006). Condom use in steady and casual sexual relationships: Planning, preparation and willingness to take risks among adolescents. *Psychology and Health, 21*, 165-181.
- Venable, P. A., Mc Kirnan, D. J., Buchbinder, S. P., Bartholow, B. N., Douglas, J. M., Judson, F. N., & MacQueen, K. M. (2004). Alcohol use and high risk sexual behavior among men who have sex with men: The effects of consumption level and partner type. *Health Psychology, 23*, 525-532.
- Weinhardt, L. S., & Carey, M. P. (2000). Does alcohol lead to sexual risk behaviour? Findings from event-level research. *Annual Review of Sex Research, 11*, 125-157.
- Weller, S. C., & Davis, B. K. (2002). Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database of Systematic Reviews, Issue 1*, (Article No. CD003255).
- World Health Organization (2007). *Global strategy for the prevention and control of STIs, 2006-2015: Breaking the chain of transmission*. Geneva, Switzerland: Author.