Effects of Alcohol, Expectancies, and Partner Type on Condom Use in College Males: Event-Level Analyses

Joseph LaBrie
Loyola Marymount University

Mitch Earleywine
SUNY—Albany

Jason Schiffman
University of Hawaii

Eric Pedersen and Charles Marriot
Loyola Marymount University

Sexually active heterosexual college males (N = 93) provided data on over 1,500 sexual encounters. Alcohol consumption, expectancies about alcohol's impact on condom use, and partner type each contributed to use of a condom. Partner type covaried with alcohol consumption and condom use. The men consumed significantly more alcohol with new partners, followed by casual partners, and then by regular partners. In contrast, they were more likely to use condoms with new partners than with casual or regular partners. Drinking alcohol decreased condom use, but only with casual partners. Expectancies about alcohol's disinhibiting sexual effects decreased condom use as well. These data suggest that alcohol consumption does decrease condom use, particularly with casual partners and when drinkers believe alcohol alters sexual disinhibition. Improving knowledge about HIV and other STD transmission in casual partners and challenging expectancies about alcohol as a sexual disinhibitor could help decrease the spread of HIV and other STDs.

Ninety percent of college students are sexually active, with many reporting multiple partners. In a survey of 5,514 first-year undergraduates, 54% of men and 37% of women already had five or more sexual partners, and 29% of men and 12% of women had 10 sexual partners (MacDonald et al., 1996). Young people also drink alcohol in large amounts. Nationally, 80-90% of all undergraduate college students' drink (Haines & Spear, 1996), and 44% of college students binge drink (drinking five or more drinks in one sitting for men or four or more for women), and 20% binge drink three or more times during a two-week period (Wechsler, Lee, Kuo, & Lee, 2000). The notion that alcohol consumption in college students results in problematic behavior is well-entrenched. From missed class to death, from vandalism to sexual assault, problematic drinking leaves its mark (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002).

Risky sex (e.g., sex without a condom) is a problematic behavior that may covary with drinking. Research indicates that the prevalence of condom use is increasing, yet approximately 82% of college men and 87% of college women continue to report sex with multiple partners while failing to use condoms consistently (Seidman & Reider, 1994). The consequences of risky sex include increased risk for HIV and other STDs. Approximately 42,000 new HIV infections occurred in the United States during 2002, an increase from the previous year by almost 1,000 newly infected people (Centers for Disease Control and Prevention [CDC], 2002). The CDC further reports that two-thirds of all non-HIV STDs occur among those under the age of 25. The large number of college students who report not using condoms consistently with multiple partners, paired with the high prevalence of student drinking, has led researchers and educators to suggest that alcohol use may increase the likelihood of HIV and other STDs by decreasing the likelihood of condom use during sex. Dingie and Oei (1997) labeled this proposed effect of drinking the "transmission hypothesis," where individuals transmit HIV and other STDs among their partners during unprotected sex while intoxicated. Public AIDS prevention campaigns have directly targeted the proposed relationship between drinking and risky sex.

Untangling the proposed relationship between alcohol and risky sex has proven to be an elusive task. The first studies examining this link were global association studies, which correlated quantity and frequency measures for alcohol use with various measures of sexual risk. These studies typically found that heavy drinkers were more likely to engage in high-risk sexual behavior, such as less consistent condom use (Hingson, Strunin, Berlin, & Heeren, 1990; McEwan, McCallum, Bhopal, & Madhok, 1992; Shillington, Cotler, Compton, & Spitznagel, 1995) and more sexual partners (Graves, 1995). A similar association, however, was absent in other studies (e.g., Gold & Skinner, 1993; Leigh,
Temple, & Trucki, 1994). Despite the generally positive findings, data from global association studies do not allow researchers to disentangle the relation between drinking and risky sexual behavior. It is not possible to determine if revealed relations are direct and causal. Since these studies do not look at specific situations involving sex and drinking, they also fail to determine whether drinking and sexual activity occur at the same time.

The next level of studies were situational association studies, which examined the relationship between risky sex and alcohol use during sexual activity. Correlations in these studies revealed that the frequency with which alcohol is consumed prior to sex is generally related to the frequency of risky sex (Bagnall, Plant, & Warwick, 1990; Buchanan, Poppen, & Reisen, 1996; Stall et al., 1986). Other studies found that not all individuals who use alcohol during sex are more likely to engage in high-risk sexual behavior (e.g., Leigh, 1990). Situational association studies are limited as well, because revealed associations may be an artifact of the relations between the total amount of sex and the total amount of risky behavior (Leigh, 2002). Also, it is not possible to determine if the occasions that included both drinking and sex were the same occasions where risky sex occurred.

Event-level studies look at particular dynamics in sexual or drinking events. In an event-level study, participants describe behavior during a particular event or several events from their lives rather than report general trends or averages of behavior. Studies involving event-level analysis have produced mixed results and vary as a function of level of analysis. Some studies report that drinking prior to first sexual events with a new partner significantly reduces the likelihood of condom use (e.g., Cooper, Pierce, & Huselid, 1994; Robertson & Plant, 1988). Other studies report no difference in condom use between sex involving drinking and sex without drinking (e.g., Bailey, Camlin, & Ennett, 1998; Testa & Collins, 1997), while another found no association between drinking and unsafe sexual practices (Temple, Leigh, & Schafer, 1993). Failing to find consistent results in a meta-analysis of event-level studies, Leigh (2002) suggested that the relations between alcohol use and risky sex might depend on the type of partner involved and the context of the sexual event. The mixed results from the first event-level studies have led researchers to focus on potential mediators and moderators of the drinking and risky sex relationship, such as expectancies, the amount of alcohol consumed, and partner type (new, casual, or regular).

Alcohol Expectancies

Alcohol expectancies are beliefs and ideas about the positive and negative effects that alcohol has on an individual’s behavior. Positive expectancies include beliefs that the use of alcohol increases sociability and reduces stress and tension. Negative expectancies include beliefs that drinking impairs motor and cognitive abilities. Most research on alcohol expectancies has shown that positive expectancies are related to heavier patterns of drinking (e.g., Marlatt & Gordon, 1985). Yet a recent review of expectancy studies reported that interpersonal and intersubjective alcohol expectancies can affect post-drinking behavior (Vogel-Sprott & Fillmore, 1999). Sex-related alcohol expectancies, which include beliefs that alcohol facilitates sexual encounters, increases arousal, desinhibits sexual behavior, and makes people less likely to use condoms during sex, might influence post-drinking sexual behavior.

Two studies (Corbin & Fromme, 2002; LaBrie, Schiffman, & Earleywine, 2002) identified a link between alcohol expectancies toward sex and subsequent risky sexual behavior. LaBrie et al. reported that expectancies specific to alcohol’s impact on condom use mediated the relation between drinking and risky sex intentions, accounting for a significant part of the link between drinking and risky sex. Corbin and Fromme found that in first sexual events with regular partners and first sexual events with casual partners, the amount of alcohol consumed correlated with lower condom use only for participants with strong sex-related alcohol expectancies, revealing an Alcohol x Expectancy interaction. For the most recent sex event with a regular partner, however, neither alcohol use nor the interaction of alcohol use and expectancies were associated with condom use. Thus, the mediation of alcohol expectancies may be further moderated by partner type or event context.

Partner Type

Distinctions between new, casual, and regular partners are important because partner type may moderate a relationship between drinking and risky sex. Corbin and Fromme (2002) only assessed people having sex with a new partner and a regular partner (both first and last events). These represent opposite ends of the spectrum, losing potentially valuable information from individuals in the middle of the continuum and potentially masking important results when looking for main effects. It is important to examine sexual events with casual partners in addition to events with new and regular partners. Casual partners can be defined as people who have had fewer than five sexual events together and who have known each other for less than one month (Weinhart et al., 1998). Casual partners fall between new and regular partners; completely new partners are novel and may be hypersensitive to the possibility of their new partner’s disease potential, whereas regular partners know each other well and may have regular patterns of sexual behavior in place. Moreover, with regular partners, perceived vulnerability to STD transmission may decrease, shifting the function of condom use from protection against STDs to prevention of pregnancy. For these participants, drinking and alcohol expectancies may have little impact on condom use since the partners will most likely have negotiated a stable pattern of sexual behavior. In contrast, casual partners most likely have not known each other long enough to have established a regular pattern of sexual activity together, and yet have reduced sensitivity to
sexual risk since they have had sex together before. These casual partner events may more likely be influenced by alcohol use and expectancies.

**Amount of Alcohol**

The amount of alcohol consumed prior to the sexual event is important to examine as well. Weinhardt and Carey (2000) suggested that there is a distinction between consuming alcohol before the sexual event (i.e., having only one or two drinks) and actually being intoxicated proximal to the event (i.e., binge drinking), and that this distinction might prove important. It may be that alcohol only impacts sexual risk-taking at certain levels of intoxication.

In an extensive review of the literature, Weinhardt and Carey (2000) suggested that large-scale survey studies using event-level assessments are necessary to determine if and in what contexts drinking impacts sexual risk-taking. Multiple-event assessment and within-subject analysis have been used in only three studies examining the alcohol-risky sex hypothesis. Larger, more detailed studies could produce evidence for such an association. Furthermore, large event-level studies with multiple sex events for each participant will make it possible to look at individual sex events involving and not involving alcohol, partners of varying levels of relationship status, and amount of alcohol consumed prior to sex.

**Hypotheses**

This study investigated the influence of alcohol consumption (number of drinks consumed prior to sex event/binge drinking prior to the sexual event) on the decision to use a condom in over 1,500 sex events in a high-risk sample of male college students. We examined the influence of partner type (new partner, casual partner, regular partner) and sex-related alcohol expectancies (low, medium, and high) as likely moderators of condom use in sex events involving alcohol consumption. We predicted that drinking prior to a sexual event would significantly decrease condom use. We further predicted that this would be moderated by type of partner; participants would use condoms more with casual partners than with regular partners, but less than with new partners. Also, we expected that alcohol would decrease condom use significantly in sex events with casual partners and that participant’s expectancies about alcohol’s sex-related effects would alter the frequency of condom use during sex involving prior drinking. An interaction between alcohol consumption and expectancy would be consistent with these ideas, with increased alcohol consumption leading to decreased condom use, particularly among people with strong expectancies about alcohol. Therefore, we predicted an Alcohol × Expectancy interaction.

**Method**

**Participants**

Male college students (N = 315) responded by phone to on-campus fliers, classroom announcements, and advertisements in the student daily newspaper seeking research participants for a study on attitudes and behaviors toward sex and drinking. Those who drank more than twice a week and who had two or more sexual partners in the previous two months were invited to participate. These criteria created a participant pool of 96 male students that could be considered high-risk with respect to drinking and sexual behavior. These students participated in the study and received a $25 stipend for their participation.

Almost all (n = 93) of these students had sex only with women. These 93 heterosexual male college students formed the sample for subsequent analyses. They averaged 20.58 (SD = 2.45) years of age, and their ethnic self-identification was representative of the institution’s student body. Sixty-nine percent were Caucasian, 18% were Hispanic, 10% were Asian American, and 3% were African American. Participants drank an average of 3.41 (SD = 2.45) times per week and consumed an average of 6.25 (SD = 2.72) drinks per drinking occasion. Participants also averaged 3.23 (SD = 1.80) sexual partners within the last three months and had a mean condom use of 59% (SD = 33.08) when engaging in sexual intercourse.

**Procedure**

An independent human subjects review board approved all procedures used in the study. Participants completed a questionnaire of basic demographic information as well as attitudinal and behavioral measures. After they completed the questionnaire, a doctoral-level psychologist certified in Motivational Interviewing interviewed each participant using the Timeline Followback Interview: Sexual Behavior and Substance Use (TLFB-SS) protocol.

**Measures**

*Timeline Followback Interview: Sexual Behavior and Substance Use.* Each participant performed the Timeline Followback Interview: Sexual Behavior and Substance Use (TLFB-SS) (Weinhardt et al., 1998; used with permission from Michael Carey). The TLFB-SS is a structured, calendar-aided interview adapted from the TLFB protocol for alcohol and drug use (Sobell & Sobell, 1992). The TLFB-SS yields a detailed assessment of sex and drinking while providing information about the behaviors and their co-occurrence on the event level. Each behavior in the TLFB-SS (sex and alcohol) is assessed separately over a 3-month period, with participants reporting on every sexual and drinking event over that period. A sex event, for the purposes of this study, was any sexual experience that included either vaginal or anal penetration or both. For each sexual event, participants described their sexual partner and reported on whether they used a condom. According to the TLFB-SS, persons with whom a participant had sex for the first time are New Partners, partners known for less than a month and with whom the participant has had sex less than five times are Casual Partners, and partners a participant knew longer than one month or with whom the participant had sex with five or more times are Regular Partners. For
each drinking event, participants reported the time of day they drank and the number of standard drinks they consumed (a standard drink is equivalent to one 12-ounce beer, one 4-ounce glass of wine, or 1 ounce of hard liquor). When drinking and sex occurred on the same day, participants reported on whether and how much of the drinking took place within two hours of the sexual event.

**Sex-Related Alcohol Expectancies.** Derman and Cooper (1994) developed a scale to assess sex-related alcohol expectancies. The scale’s 3-factor structure has good statistical properties. The factors are sexual enhancement (Factor 1), increased sexual risk-taking (Factor 2), and disinhibition of sexual behavior (Factor 3). Each participant in the current study determined his level of agreement on a 7-point Likert scale for each of the items. Factors 2 and 3 reflect the extent to which alcohol impacts potential risky behaviors and, therefore, they are more conceptually appropriate and sensitive to expectancy effects on alcohol-related risky behavior than Factor 1. Therefore, only scores from these two factors were used in the analyses of alcohol expectancies.

The sexual risk-taking factor measures items such as “I am less likely to take precautions before sex,” “I am less likely to use a condom,” and “I am less likely to talk with a new sexual partner.” Items on the disinhibition factor include “I have sex with people I wouldn’t have sex with if I were sober,” “I am more likely to do sexual things I wouldn’t do when sober,” and “I find it harder to say no to sexual advances.”

**RESULTS**

**Descriptive Data**

The 93 participants reported 1,538 sexual events; 207 (14%) occurred with a new partner (first-time sexual event with that partner), 171 (11%) occurred with a casual partner (known less than a month or fewer than 5 sex events together), while 1,160 (75%) occurred with a regular partner (known more than a month or more than 5 sex events). Condoms were used in 764 (49%) sexual events.

**Analyses Across All Sex Events**

**Partner type predicting alcohol consumption.** For each sex event, partner type (new, casual, or regular) was entered as a fixed factor, with Amount of Alcohol Consumed (number of drinks consumed) entered as the dependent measure in a one-way ANOVA. There were significant differences of alcohol consumption between partner types, F(2,1535) = 32.754, p < .001. Post hoc comparisons also revealed significant differences in alcohol consumption between all partner types (all two-way comparisons were significant at p < .01). Greatest alcohol consumption occurred within two hours before sex between new partners (M = 4.8 drinks, SD = 5.2), followed by sex with casual partners (M = 3.2 drinks, SD = 5.0) and sex with regular partners (M = 2.3 drinks, SD = 3.8).

**Partner type predicting condom use.** The relationship between partner type (new, casual, or regular) and condom use (yes or no) was examined, revealing significant differences in condom use across partner types, χ²(2, N = 1, 538) = 29.67, p < .0001. Sixty percent of new partner sex events and 63% of the casual partner sex events involved condom use. However, condoms were only used in 45% of the regular-partner sexual encounters. As expected, participants used condoms more often with new or casual partners than they did with regular partners.

**Alcohol consumption predicting condom use.** Out of 630 sex events in which participants drank alcohol, 45% (285) involved a condom and 55% (345) did not. Out of 908 sex events in which participants did not drink, 53% (479) involved condoms and 47% (429) did not. There was a significant relationship between whether or not drinking occurred prior to sex and condom use, χ²(1, 1, 538) = 6.603, p < .01, revealing that drinking before the sexual event was significantly related to decreased condom use across all events, regardless of partner type. Thus, over all sex events, drinking prior to sex is associated with reduced condom use, and drinking occurs more in new and casual partner sex events when compared to regular partner events.

**Within-Subject Analyses of Alcohol Consumption on Condom Use**

Within-subjects analyses of whether or not drinking occurred prior to sex and condom use were conducted using paired samples t-tests. Participants’ means for condom use when drinking were compared to means for condom use when not drinking for each partner type. Only those participants with less than 100% condom use were used in these analyses since these participants engaged in risky sex at least some of the time, and thus, drinking may influence their condom use. There were no significant differences between participants’ mean percentage of condom use when drinking compared to not drinking in sexual events with new partners (M = 65%, SD = 46.4 vs. M = 66%, SD = 46.2) and regular partners (M = 43%, SD = 42.7 vs. M = 50%, SD = 41.8). However, in sexual events with casual partners (not the first event), drinking did negatively influence condom use, t(35) = -2.30, p < .05. In these events, the mean percentage condom use when drinking occurred prior to sex was 56% (SD = 47.2), while the mean when not drinking was 72% (SD = 38.7). Mean percentages of condom use by partner type with and without drinking are shown in Figure 1.

**Between-Subjects Analyses on the Role of Alcohol Expectancies**

Scores from the Sex-Related Alcohol Expectancies questionnaire were used to create three levels of composite expectancies: low (n = 21), medium (n = 41), and high (n = 31). Based on median splits of the disinhibition and sexual risk-taking factors, participants who scored above the median on both factors were placed into the high expectancy group, those who scored above the median on one factor while scoring below the median on the other were placed into the medium group, and participants who
scored below the median on both factors were placed into the low group. Those classified in the high expectancy group had expectancies that drinking would inhibit them sexually and interfere with their ability to practice safer sex. Participants in the low expectancy group did not believe that alcohol inhibited them sexually or interfered with safer-sex practices. We created these expectancy groups to determine if prior expectancies impacted condom use when drinking.

Composite expectancy (low, medium, and high) was entered as a fixed factor with participants’ mean percentage condom use with drink and condom use with binge drink entered as the dependent measures in separate one-way ANOVAs. For events involving drinking at any level, there was a significant interaction effect for expectancy group on condom use, $F(2, 82) = 4.23, p < .05$. Post hoc comparisons (LSD) revealed significant differences in mean condom use percentage between participants in the low expectancy group ($M = 65\%, SD = 36.03$) and the high expectancy group ($M = 35\%, SD = 36.49$), as well as between medium ($M = 58\%, SD = 39.45$) and high expectants (see Figure 2).

There also was a significant interaction between expectancy group and binge drinking before sex on mean condom use percentage ($F(1, 39) = 7.08, p < .01$). Again, post hoc comparisons revealed significant differences in mean condom use percentage when binge drinking occurred prior to sex between the high expectancy group ($M = 31\%, SD = 33.32$) and the low expectancy group ($M = 62\%, SD = 38.35$), as well as between the medium expectancy group ($M = 61\%, SD = 40.22$) and the high expectancy group.

To determine if the interaction between expectancy group and drinking was influenced by amount of alcohol consumed, we analyzed sex events in which drinking occurred and in which participants drank fewer than five drinks (non-binge drinking). For those sex events that did not involve binge drinking prior to sex, there was no significant interaction between expectancy group and drinking on condom use. Participants’ mean condom percentage for non-binge drinking sex events was $52\% (SD = 44.18)$. Thus, it appears that the revealed differences between groups when drinking and when binge drinking are most directly related to the binge drinking incidents. Amount consumed and expectancy group interact to reduce condom use for those who drink more than five drinks and who expect drinking to increase their risk-taking.

**Further Analysis of Expectancies**

For each partner type, the risk-taking and disinhibition factors of the sex-related alcohol expectancies of participants were each entered as a fixed factor, with condom use percentage with drink entered as the dependent measure, in separate one-way ANOVAs. Disinhibition expectancies were related to percent condom use with drink for casual partners, $F(1, 32) = 8.31, p < .01$, and percent condom use with drink for all sex events, $F(1, 83) = 7.5, p < .01$. Results were not significant for risk-taking expectancies, revealing that expectancies participants hold about alcohol’s effects on their inhibitions may be more influential in the decision to use a condom relative to expectancies about alcohol’s effects on risk-taking.

We compared means in an effort to clarify the disinhibition expectancies’ influence on condom use percentage when alcohol is consumed proximal to the sex event versus when no drinking occurs before sex. Again, participants who always used a condom were excluded from the analysis based on the rationale that they are not at risk for problems associated with risky sex. Also, participants were divided into low and high disinhibition groups based on a median split of that sex-expectancy factor.

In sex events involving alcohol, participants in the low disinhibition expectancy group used a condom significantly more ($M = 66.13\%, SD = 36.74$) than participants in the
Because activation of specific expectancies in memory related to condom use, thereby impacting actual condom use. Countering these expectancies through various challenges could prove particularly helpful. Alcohol expectancies for safe sex likely develop iteratively: each sexual encounter that follows drinking contributes to expectancies about the next. These expectancies may respond to the standard cognitive interventions that alter other drug-related beliefs, such as re-framing or examining evidence (Beck, Wright, Newman, & Liese, 1993). In addition, expectancy challenges, which surreptitiously administer placebos to drinkers and then reveal that any behavioral effects are self-generated, have altered drinking behaviors (Darkes & Goldman, 1993). Comparable challenges might assess sexual disinhibition in people who believe that they have consumed alcohol. If persons receiving placebo report heightened sexual disinhibition, they may realize that the effect is not pharmacological after they learn that they have consumed a placebo.

The role of monogamy and variation is clearly important to these findings. The participants each had more than two sexual partners in over two months. Surprisingly, participants almost universally categorized a partner as monogamous (over 90% of partners were classified as monogamous), even if they had several partners in the same week or within a few weeks. This result suggests that traditional notions of monogamy (being sexual only with one person to whom one is committed in a long-term relationship) are not operational among these college men. It is unclear if their partners considered them monogamous. Thus, thinking of sex with a monogamous partner as safe can prove dangerous. This is particularly true given the current findings in casual partner sex events. College males may have multiple casual sex partners while thinking they are monogamous and that alcohol negatively impacts condom use with these partners, thus putting them at greater risk for STD transmission. Based on the non-traditional understanding of monogamy among this age group, researchers and health professionals can no longer rely on self-reports of monogamy to infer minimized risk for HIV and other STD transmission. Regular partners may need to be emphasized as partners in which only strong, trustful, traditionally monogamous relationships are established. Even in these relationships, however, condom use should still be encouraged.

Several improvements could enhance future event-level research. There was no difference in condom use between expectancy groups when non-binge drinking occurred. However, after binge drinking, the participants with strong disinhibition and risk-taking expectancies (high expectancy group) averaged 31% condom use, compared to 62% in the low expectancy group. Although this finding is important, accounting for the level of intoxication instead of the amount of alcohol consumed is an important distinction that future research could pursue. Including each participant's height and weight, allowing for more accurate estimates of the level of intoxication, might better explain the
relationship of actual intoxication level during the sexual event with condom usage.

Similarly, since the only substance assessed was alcohol, it is unknown whether sex occurred in concert with alcohol alone. Other drugs could have contributed to sexual risk-taking, used alone or in combination with alcohol. Future studies examining multi-drug and alcohol use with sexual behavior would provide additional information regarding how, in what circumstances, and in what combinations substance use is related to risky sexual behavior.

Further, with only 93 heterosexual male participants from a college sample, the generalizability of results may be limited. Further research is needed examining multiple events over time using larger and more representative samples of the overall population. The present college male participants represent a high-risk population due to their predilection for high alcohol consumption and sexual frequency. Many students begin drinking heavily once college begins, and increased opportunity for sexual encounters with new and casual partners may emerge. Examining samples that include gay or bisexual men, women, and people who vary more in age, education, and health status could help present a clearer picture of the mediators and moderators between alcohol consumption and risky sexual behaviors. The role of alternative forms of birth control as potential deterrents to condom use may be particularly important in studies of women.

Nonetheless, the high-risk male college students examined in this study are an important population to understand, both for reducing negative effects of drinking and stemming the growing rate of HIV and other STDs among young adults. By choosing a high-risk sample, this study found a drinking and risky sex relationship in one of the worst strategic groups on college campuses. These young men drink frequently and have sex with multiple partners over a short period of time. Thus, it may be that male students who average 15 sexual events over a three-month period, who engage in sexual activity with more than one partner, and who drink regularly may form an STD core group on many college campuses. These "high risk" students are engaging in risky sexual behavior, and their condom use appears to be reduced depending on the amount of alcohol consumed before sex, sex-related alcohol expectancies, and type of partner.

These data establish that alcohol consumption and alcohol expectancies contribute to risky sex behavior and that sexual encounters with casual partners that involve drinking can prove particularly risky for failing to use a condom. Enlightening students about the risks of sex with casual partners and challenging their expectancies about alcohol as a sexual dis-inhibitor might help decrease the spread of HIV and other STDs in the college population.

REFERENCES


Effects of Alcohol, Expectancies, and Partner


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