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# Profiles of Motivations for Alcohol Use and Sexual Behavior Among First-Year University Students

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## Abstract

The links between motivations for alcohol use and sexual behaviors are not well understood. Latent profile analysis was used to identify drinking motivational profiles (based on motivations for: Fun/social, Relaxation/coping, Image, Sex; motivations against: Physical, Behavioral) and sex motivational profiles (motivations for: Enhancement, Intimacy, Coping; motivations against: Not Ready, Health, Values) among college students (N=227, 51% male). Latent profiles for drinking were: Low For/High Against Drinking (34%), Average Drinking Motives (53%), and High For/Low Against Drinking (13%). Profiles for sex were: Low For/High Against Sex (35%), High For/Low Against Sex (42%), and High For with Coping/Moderate Against Sex (23%). Motivational profiles were related across behaviors. Drinking motivational profiles were associated with alcohol use and psychosocial adjustment; sex motivational profiles were associated with sexual experiences. Distinct profiles of motivations support the need for differentiated intervention programs targeting individuals with different patterns of reasons for engaging in risk behaviors during late adolescence.

### Keywords

motivation; alcohol use; sexual behavior; latent profile analysis; college students

Motivations, or the functions a behavior serves and the needs that it meets, are understood as the most proximal antecedents to behavior (Cooper, 1994; Cox & Klinger, 1988; Kuntsche, Knibbe, Gmel, & Engels, 2005). Therefore, documenting the combinations of motivations that underly behaviors such as alcohol use and sexual behavior helps eludicate key factors in determining whether and how much individuals choose to drink and have sex. As Cooper, Frone, Russell, and Mudar (1995) argued, engagement in a single behavior, such as alcohol use, actually "represents multiple *psychologically distinct* behaviors defined by the distinct underlying functions they serve" (p. 990) for different individuals. According to this functional perspective, outwardly similar behaviors may meet very different needs and identifying these functions could be a key factor in understanding behavior (Cooper, Agocha, & Powers, 1999). That is, in order to understand behaviors such as alcohol use and sexual behavior, it is

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necessary to understand the motivations these behaviors serve for individuals. In the present study, we investigate configurations of motivations for alcohol use and sexual behavior in a population at risk for negative consequences associated with these risk behaviors, namely college students (Cooper, 2002), as an exploratory step to inform developmental models of behavior and interventions to promote individual well-being and public health.

Engagement in risk behaviors such as alcohol use and risky sexual activity is a widely acknowledged cause of negative physical health-related consequences (Centers for Disease Control and Prevention [CDC], 2000). These behaviors are also associated with risk and protective factors for psychological well-being (Zweig, Phillips, & Lindberg, 2002). Despite the negative consequences experienced from heavy drinking (e.g., hangovers, accidents) and risky sexual behavior (e.g., sexually transmitted diseases [STDs], unwanted pregnancy), many students engage in both behaviors throughout their college years (Cooper, 2002; Johnston, O'Malley, Bachman, & Schulenberg, 2005; Lefkowitz & Gillen, 2005; NIAAA, 2006). One explanation for engagement in behaviors that pose such serious risks to personal health is that these behaviors may be motivated by a variety of valued needs (Cooper & Shapiro, 1997). Indeed, adolescents and college students may be making rational choices to engage in these behaviors based on their perceptions of the importance of potential risks and benefits (J. H. Goldberg, Halpern-Felsher, & Millstein, 2002). For example, some "negative" effects of heavy drinking, such as doing or saying something embarrassing, may be reinforcing for individuals who would choose to use alcohol again in order to receive similar peer approbation (Leigh, 1989a). Therefore, it is important to understand the motivations that individuals have for engaging in and not engaging in risk behaviors.

## Motivations for Alcohol Use

Research on individual predictors of alcohol use supports the role of motivations in predicting alcohol use cross-sectionally and longitudinally over months and years (Baer, 2002; Goldman, Del Boca, & Darkes, 1999; Komro et al., 2001; Leigh, 1989a). Adolescents and young adults typically drink to obtain social rewards, to enhance positive mood, to reduce negative mood, and to avoid social alienation (Cooper, 1994; Cox & Klinger, 1988; Kuntsche et al., 2005). Drinking for social motives appears most common, along with enhancement motives, while only a minority of college students drinks to cope (Kuntsche et al., 2005). Furthermore, drinking motivations are associated with particular patterns of alcohol use. In general, social drinkers exhibit more moderate alcohol use, enhancement drinkers engage in heavy alcohol use, and individuals with coping motivations manifest drinking problems and addictions (Cooper et al., 1995; Cox & Klinger, 1988; Kuntsche et al., 2005). College students, in particular, engage in heavy episodic alcohol use at high rates (Johnston, O'Malley, Bachman, & Schulenberg, 2008; Timberlake et al., 2007) and typically report high social motivations for alcohol use (Maggs, 1997). This body of research provides a foundation for the current study by identifying multiple drinking motivations that may be important elements in alcohol use etiology as well as its short- and long-term consequences.

## Motivations for Sexual Behavior

Whereas public health research documents the prevalence and health consequences of sexual *behaviors* across demographic groups, the presence and importance of underlying sexual *motivations* have received less attention (Brooks-Gunn & Paikoff, 1993; Diamond, Savin-Williams, & Dube, 1999). However, Hill's (2002; Hill & Preston, 1996) sexual motivation model described the perceived likelihood of experiencing rewarding interpersonal incentives resulting from sexual behavior. Among college students, the most salient rewards were experiencing pleasure, needing to be valued, providing and receiving comfort, and feeling and expressing affection. Similarly, Cooper and colleagues (1998) distinguished self-focused from

other-focused sexual motivations, where the former were motivated by agentic or identity needs (e.g., affirming attractiveness) and the latter were motivated by the desire for intimacy. Surveys of adolescents (Hill & Preston, 1996; Leigh, 1989b) have empirically identified practical reasons for sex (e.g., to reproduce) as well as emotional reasons (e.g., to express closeness). A core set of reasons adolescents have sex includes loving the partner, believing that the "time is right," and, for men, sexual opportunism (Eyre & Millstein, 1999; Leigh, 1989b). Among college students, salient motivations for sexual behavior appear to be pleasure, comfort, and affection. About half of incoming college students will have their first sexual experience during the college years (Cooper, 2002; Patrick, Maggs, & Abar, 2007; Siegel, Klein, & Roughmann, 1999).

Reasons *not* to have sex are especially understudied, despite their clear relevance for predicting behavior and for public health messages. In Sprecher and Regan's (1996) study of sexually abstaining college students, the reason rated as most important in deciding not to have sex was that students had not found the right person and were not in love. Personal beliefs, fear of rejection, and avoiding pregnancy and disease have also been reported (Leigh, 1989b; Sprecher & Regan, 1996). Therefore, readiness for sex, concerns over pregnancy and STDs, and ethical beliefs are important domains to assess as motivations not to have sex among college students.

## Associations between Domains of Behaviors

A global overlap of alcohol use and sexual behavior is well documented, with drinkers also tending to be more likely to have sex (for reviews see Cooper, 2002; Leigh & Stall, 1993). In particular, heavy episodic drinkers tend to also engage in risky sexual behaviors, including with multiple partners. A positive relationship between the two behaviors is clear, although the level at which the association exists is less so (Cooper & Orcutt, 2000; Leigh & Stall, 1993). The ways in which these behaviors and their underlying motivations may be intricately linked within persons are not yet fully understood. For example, people who drink in order to facilitate having sex may also have sex to feel better about themselves. Understanding these cross-behavior motivations may help explain and predict both behaviors, and give insight into appropriate programs to promote health among individuals with distinct motivational profiles.

In general, people are strongly motivated by attaining pleasure and avoiding pain (Higgins, 1997; Solomon, 1980). However, whether strong hedonistic motivations for drinking co-occur with similar pleasure-seeking motivations for sexual behavior is yet to be documented. Similarly, whether individuals who use alcohol to cope also have sex for similar reasons is unknown. The current study, therefore, investigated person-centered associations in motivations across two behavioral domains, namely motivations for alcohol use and motivations for sexual behavior.

## Significance

Assessing motivations for and against alcohol use and sexual behavior in the same people, and for individuals with varying levels of drinking and sexual experience, provides new and needed information about motivations for behavior. Identifying the motivational profiles of individuals with the greatest health risks (e.g., multiple sexual partners, evidence of alcohol problems) is necessary in order to design differentiated intervention programs targeted to particular audiences. For example, effective strategies for promoting condom use for individuals who have sex to achieve different goals may differ (Cooper et al., 1999; Cooper & Orcutt, 2000). The current study was designed to improve understanding of the potential associations of positive and negative motivations, behaviors, and consequences of alcohol use and sexual behavior to inform the development of motivational interventions to reduce heavy alcohol use and risky sexual behavior for college students. In addition, the association of motivational profiles with indicators of behavior and psychosocial adjustment were investigated. Previous

research, for example, indicates that neuroticism is associated with negative affect, more negative social relationships, and tendency for mental health problems (e.g., Steel, Schmidt, & Shultz, 2008). Therefore, identifying motivational profiles with both behavioral and adjustment correlates has implications for health and well-being of adolescents and young adults.

## The Current Study

The study was designed to describe the existence of motivational profiles for alcohol use and sexual behavior and their associations across domains and with behavior. Three specific aims were addressed: (1) to explore whether groups of individuals with distinct profiles of positive and negative motivations for alcohol use and sexual behavior could be identified; (2) to describe the cross-domain associations between profiles of motivations for alcohol use and for sex; and (3) to determine if profiles were associated with gender, alcohol use, alcohol problems, sexual behavior, and psychosocial adjustment. First, latent profile analysis (LPA) (Gibson, 1959; Lazarsfeld & Henry, 1968) was used to assess similarities and differences between college students based on motivations. This person-centered approach is similar to latent class analysis (e.g., Collins, Graham, Long, & Hansen, 1994), but uses continuous (rather than discrete) indicators to identify groups of individuals with distinct profiles of similarly high or low values across each of the motivation subscales. Second, the identification of profiles for alcohol use and sexual motivations then allowed for the comparison of individuals with specific primary profiles for the two behaviors across domains to explore how the configurations of underlying reasons for the two behaviors were related. Finally, differences between people with these profiles were assessed to determine if there were gender differences in profile membership, and if some motivational groups were particularly likely to exhibit high risk alcohol use, sexual behaviors, or positive psychosocial adjustment. Research documenting associations between motivations for alcohol use and sexual behavior is rare. However, based on evidence that individuals who drink more tend to engage in more sexual behavior (Cooper, 2002) and studies from the alcohol use and sexual behavior literatures separately documenting similar variable-centered types of motivations (i.e., emotion regulation, social reasons) some cross-domain links using person-centered analyses were anticipated.

## Method

### Participants

Participants ($N$ = 227, 51.1% male) were recruited as part of a study designed to examine links between alcohol use and sexual behavior across days and years among traditionally-aged first-year college students. To be eligible for the study, participants at a large Northeastern university in the United States were required to be first-year students, 18 to 20 years of age, and U.S. citizens or permanent residents. Individuals from racial and ethnic minorities were over-sampled to achieve sample diversity. Based on self-reports, 27.9% of participants identified as Hispanic/Latino. The remainder of participants identified as non-Hispanic/Latino; 27.0% identified as European American, 15.5% as African American, 19.3% as Asian American/Hawaiian/Pacific Islander, and 10.3% as more than one race. On campus residence was reported by 96.8% of the students. Mean age was 18.85 years ($SD$ = 0.38, range 18.12 – 20.74).

Recruitment letters were sent to 336 students with a pen and $5 in cash, followed by email invitations containing a secure link to the web surveys. Incentives for participation were the $5 pre-incentive and a $25 survey incentive. Recruitment rate (i.e., percent of eligible individuals who provided data) was 69.3% ($N$ = 233). Data on sexual and alcohol use motivations for the current analyses were available for 97.4% of these (67.6% of eligible individuals). Informed consent was obtained via an electronic signature following full

disclosure. This study was approved by the Institutional Review Board and protected by a Certificate of Confidentiality from the U.S. federal government.

## Measures

**Motivations—**Three scales from the Importance of Consequences of Drinking (ICOD) short form (Maggs, 1993) assessed the importance of achieving positive alcohol consequences on a scale of 0 = *not important to me* to 4 = *very important to met*. Motivations for Drinking included: Fun/Social motivations (5 items, e.g., have a good time, α = .94), Relaxation/Coping motivations (4 items, e.g., help you unwind, α = .90), and Image motivations (4 items, e.g., maintain your reputation; α = .83). In addition, Sex motivations for drinking questions were designed for the current study (2 items, i.e., have a sexual experience, enjoy a sexual experience more). Also, two ICOD scales assessing Motivations Against Drinking included avoiding Physical alcohol consequences (4 items, e.g., pass out; α = .89) and Behavioral alcohol consequences (3 items, e.g., do something embarrassing; α = .73). The ICOD has shown high content validity, internal consistency, and concurrent/predictive validity among college students with the physical and behavioral scales combined (Maggs, Vesterdal, & Galambos, in review).

Cooper et al.'s (1998) Sexual Motivations Scale – Revised (SMS-R) and the Motivations Against Sex Questionnaire (MASQ) (Patrick, Maggs, Cooper, & Lee, 2009) were used. Factor structure and configural invariance across gender, ethnicity, and level of sexual experience are documented in Patrick et al. (2009). Motivations for Sex scales assessed: Intimacy (5 items, e.g., to express love; α = .92), Enhancement (5 items, e.g., it feels good; α = .91), and Coping (5 items, e.g., to cheer up; α = .88). Motivations Against Sex scales (Patrick et al., 2009) included: Not Ready (3 items, e.g., do not feel old enough; α = .67), Health (3 items, e.g., fear of STDs, α = .80), and Values (3 items, e.g., against your beliefs; α = .87) motivations.

**Alcohol Use and Problems—**Standard summary measures adapted from the Monitoring the Future study assessed the frequency of alcohol use in the past three months and frequency of binge drinking in the past two weeks (Johnston et al., 2008). Frequency of alcohol use was assessed by the question, "On how many occasions have you had alcoholic beverages to drink – more than just a few sips – during the last 3 months?" on a scale of 0 = *0 occasions*, 1 = *1–2 occasions*, 2 = *3–5 occasions*, 3 = *6–9 occasions*, 4 = *10–19 occasions*, 5 = *20–39* occasions, 6 = *40 or more occasions*. The frequency of binge drinking (4+/5+ drinks) was assessed by the question, "Think back over the last two weeks. How many times have you had four [five] or more drinks in a row?" for females [males]. This combines quantity and frequency to reflect the level of gender-specific binge drinking. The gender-specific measure was used due to gender differences in ability to metabolize alcohol and typical body weight (Wechsler, Dowdall, Davenport, & Rimm, 1995). Responses were on a scale of 0 = *None*, 1 = *Once*, 2 = *Twice*, 3 = *3–5 times*, 4 = *6–9 times*, and 5 = *10 or more times*.

Alcohol problems were assessed by the Rutgers Alcohol Problem Index (RAPI) (White & Labouvie, 1989). The RAPI screens for problem drinking, with high internal consistency (α = .92 in the present sample) and good convergent validity with other measures of alcohol use and abuse (White & Labouvie, 1989). Respondents reported how often they had ever experienced 23 negative alcohol-related consequences (e.g., not able to study, got into fights) on a scale of 0 = *none*, 1 = *1–2 times*, 2 = *3–5 times*, and 3 = *More than 5 times*. The mean of all items was used.

**Sexual Behavior and Health—**Participants were asked whether they had ever performed oral sex, ever received oral sex, and how many oral sex partners they had had in their lifetime. Number of lifetime oral sex partners was coded as the number of partners reported, or as 0 if

participants reported never engaging in either type of oral sex. A separate set of questions asked whether participants had engaged in penetrative sex (defined for participants as "sex in which the penis penetrates the vagina or anus") during the past 12 weeks and the number of penetrative sexual partners they had had in the past 12 weeks.

**Psychosocial Adjustment—**Neuroticism was assessed by 10 items (α = .85; e.g., I get upset easily) on a scale of 0 = *very inaccurate* to 4 = *very accurate* (L. R. Goldberg, 1992). Peer self-image was measured with 9 items (α = .77; e.g., I do not have a particularly difficult time making friends) on a scale of 0 = *does not describe me at all* to 5 = *describes me very well* (Offer, Ostrov, & Howard, 1984). Self-esteem was rated on a scale of 0 = *never true* to 4 = *almost always true* with 10 items (α = .86; e.g., I am a useful person to have around; Rosenberg, 1965).

### Plan of Analysis

Aim 1 was to distinguish profiles of motivations using LPA to group patterns of responses to the motivational scales for alcohol use and for sexual behavior (separately). Analyses were conducted regardless of alcohol use and sexual behavior histories. Continuous indicators of motivations for and against alcohol use and sex were each entered separately by behavioral domain into LPAs using MPLUS 4.21 (Muthén & Muthén, 1998–2007). LPA assumes that the associations between the scales can be appropriately explained by a categorical profile variable (Waller & Meehl, 1998). Solutions with two to five classes were compared for each behavior. Solutions were chosen based on multiple fit statistics (i.e., AIC, BIC, Adjusted BIC), interpretability of profiles, entropy values, and the criterion of avoiding very small cell sizes (e.g., Bauer & Shanahan, 2007). Entropy was also used to indicate the level of classification precision, with values closer to 1 reflecting better classification (Celeux & Soromenho, 1996; Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993). A Drinking Motivational Profile and a Sex Motivational Profile were identified for each person based on the highest probability so that differences between groups could be examined. To address Aim 2, a chi-square table crossing drinking motivational profiles by sex motivational profiles was examined with difference in proportion tests to compare the numbers and percentages of individuals in each combination of motivational profiles. Aim 3 was to investigate gender differences and whether profiles were predictive of alcohol use and consequences, sexual behaviors, and psychosocial adjustment. A generalized linear model and analyses of variance (ANOVAs) were used, preceded by tests of multivariate significance in the case of multiple dependent variables (e.g., Neter, Kutner, Nachtsheim, & Wasserman, 1996).

## Results

### Descriptive Statistics: Behavior and Adjustment

The mean frequency of alcohol use in the past three months was about six occasions (i.e., a mean of 2.7, where 2 = *3–5 occasions* and 3 = *6–9 occasions*) and the mean of binge drinking was about twice in the past two weeks (i.e., a mean of 1.23, where 1 = *1–2 times* and 2 = *3–5 times*). On average, participants reported experiencing relatively few of the alcohol problems on the RAPI (*M* = 0.30, *SD* = .40; where 0 = *never* and 1 = *1–2 times*). However, 72.6% (*n* = 164) reported experiencing at least one RAPI consequence. With respect to lifetime sexual behavior, one-third (*n* = 76) reported never having oral sex; 21.4% (*n* = 49) reported one lifetime partner; 18.3% (*n* = 42) reported two; 12.7% (*n* = 29) reported three; and 14.3% (*n* = 33) reported four or more. For penetrative sex in the past 12 weeks, 56.0% (*n* = 130) reported no partners; 34.1% (*n* = 79) reported one; 8.2% (*n* = 19) reported two; and 1.7% (*n* = 4) reported three or more.

## Latent Profile Analysis

Aim 1 was examined using LPA to describe patterns of motivations regarding alcohol use and sexual behavior (separately). Models were chosen based on fit statistics, entropy values, and conceptual interpretability. With the addition of classes, the absolute fit statistics all decreased indicating better fit. However, the incremental improvement in AIC, BIC, and Adjusted BIC decreased with each additional class. The asymptote of incrementally better fit (i.e., incremental improvement), therefore, is an important indicator. For alcohol motivations, the asymptote of change in fit statistics indicated that either a three-class (AIC = 3146.7; BIC = 3453.6; Adj BIC = 3153.6) or four-class (AIC = 3063.9; BIC = 3177.2; Adj BIC = 3072.6) solution would be most appropriate, compared to two-class (AIC = 3377.9; BIC = 3443.2; Adj BIC = 3383.0) and five-class (AIC = 2985.5; BIC = 3122.8; Adj BIC = 2996.0) models. The three- and four-class solutions shared the same first three classes, with the four-class solution separating out an additional class with particularly high motivations for drinking in order to have sex. In the interest of parsimony and based on model fit indices, the three-class model was chosen.

For sex motivations, the three-class model (AIC = 3854.6; BIC = 3944.2; Adj BIC = 3861.8) was chosen due to a better fit to the data than the two-class model (AIC = 3968.6; BIC = 4034.1; Adj BIC = 3973.9). The four-class (AIC = 3803.7; BIC = 3917.5; Adj BIC = 3812.9) and five-class (AIC = 3146.7; BIC = 3453.6; Adj BIC = 3072.6) solutions for sex motivations were rejected because they included profiles with only 11 or 13 people (<6% of participants). Precision of the classification, as measured by entropy, was high in the selected models (drinking motivational profile = .92; sex motivational profile = .83).

Latent class probabilities for most likely profile membership showed good discrimination (average posterior probabilities .95 to .97 for the three drinking motivational profiles and .91 to .96 for the three sex motivational profiles). A value of .95 indicates a 95% probability of being in a specific profile. As a result of the good discrimination between profiles (i.e., high posterior probability values with entropy > .80), it was possible to assign individuals to their most likely profile for subsequent analyses (Clark & Muthén, 2009).

Distinct alcohol use motivational profiles were distinguished, as follows (see Table 1). The first profile, labeled Low For/High Against Drinking, characterized the motivations of participants ($n$ = 76) who reported motivations against alcohol as very important and motivations for alcohol as not important to them. Individuals in this group had lower than average Fun/Social (1.16 SDs lower than the sample mean), Relaxation/Coping (.79 SDs lower), and Image (.65 SDs lower) motivations for drinking and higher than average Physical and Behavioral motivations against drinking (>0.5 SDs higher).

The second profile, Average Drinking Motives, described individuals ($n$ = 122) who rated both motivations for drinking (especially Fun/Social) and motivations against drinking as important to them. This group's endorsement of Fun/Social motivations was .60 SDs higher than the sample mean, Relaxation/Coping motivations .31 SDs higher than the mean, and Image and Sex motivations within .25 SDs of the sample mean. In addition, Physical and Behavioral motivations against drinking were within .20 SDs of the sample mean.

The third profile, High For/Low Against Drinking, described college students ($n$ = 29) who reported that all motivations for drinking were important to them and both motivations against drinking were of some importance to them (though less so than for any other group). This group's means were .93 SDs higher than average for Fun/Social, 1.02 SDs higher for Relaxation/Coping, 1.36 SDs higher for Image, and 2.31 SDs higher for Sex motivations for drinking. Motivations against drinking were the lowest of all groups: .41 SDs and .28 SDs lower for Physical and Behavioral domains, respectively.

In addition, three distinct profiles of motivations for sex were identified (see Table 2). The first profile, Low For/High Against Sex, captured the motivations of participants ($n$ = 82) who endorsed the importance of all motivations against sex, but were neutral (i.e., the midpoint on a scale of not important to important) regarding the importance of Intimacy motivations for sex. Similar to the Low For/High Against Drinking profile, individuals in this group reported higher than average motivations against sex and lower than average motivations for sex. Means were .67 SDs lower than the sample mean on Intimacy, .96 SDs lower on Enhancement, and .61 SDs lower on Coping motivations for sex. Motivations against sex were rated as more important by this group for Not Ready (.69 SDs higher), Health (.44 SDs higher), and Values (.81 SDs higher) motivations as compared to the overall sample means.

The second profile, High For/Low Against Sex, described individuals ($n$ = 97) who rated Intimacy and Enhancement (but not Coping) as important motivations for sex. Intimacy motivations were .37 SDs higher on Intimacy and .30 SDs higher on Enhancement, but .33 SDs lower on Coping as compared to the full sample. In addition, individuals in the High For/Low Against Sex group reported the lowest levels of all three groups on motivations against sex: .52 SDs lower on Not Ready, .41 SDs lower on Health, and .61 SDs lower on Values than the sample mean.

A third profile, High For with Coping/Moderate Against Sex, described participants ($n$ = 53) who highly endorsed all motivations for sex and moderately (Not Ready, Values) or highly (Health) endorsed motivations against sex. Motivations for sex among individuals in this profile were .34 SDs higher on Intimacy, .92 SDs higher on Enhancement, and 1.56 SDs higher on Coping than the sample mean. Motivations against sex were all within .15 SDs of the sample mean.

The LPAs indicated the presence of distinct profiles of motivations for drinking and sex, such that there are individuals with different constellations of motivations for the two behaviors. Next, questions regarding cross-behavior motivational associations, gender and behavioral differences in motivational profiles, and psychosocial adjustment correlates were investigated. Associations between Profiles for Drinking and Sex

Addressing Aim 2, drinking motivational profiles and sex motivational profiles were associated (see Table 3), $\chi^2$ (4, $N$ = 227) = 42.69, $p < .001$. Difference in proportions tests were used to determine which contrasts were statistically significant in Table 3. Overall the diagonal percentages tended to be larger than the off-diagonal percentages, indicating the associations between motivational profiles for alcohol use and sexual behavior. Specifically, individuals with Low For/High Against Drinking motivational profiles were most likely to also have Low For/High Against Sex motivational profiles (rather than High For/Low Against Sex [$Z$ = 2.12, $p < .05$] or High For with Coping/Moderate Against Sex [$Z$ = 4.76, $p < .05$]). Individuals classified as having Average Drinking Motivations were most likely to also have High For/Low Against Sex motivational profiles (rather than Low For/High Against Sex [$Z$ = 3.00, $p < .05$] or High For with Coping/Moderate Against Sex [ $Z$ = 3.92, $p < .05$]). Finally, students in the High For/Low Against Drinking profile tended to also be in the High For with Coping/Moderate Against Sex group. However, this contrast was only significant for Low For/High Against Sex ($Z$ = 3.61, $p < .05$) and not for High For/Low Against Sex ($Z$ = 0.97, *n.s.*). In other words, this group that was highly motivated toward drinking was divided between the two profiles most highly motivated for sex.

## Associations of Group Membership with Gender, Behaviors, and Adjustment

The third aim was to investigate how gender, alcohol use and consequences, sexual behaviors, and psychosocial adjustment differed by profile membership.

**Gender—**A generalized linear model simultaneously tested for mean differences in gender composition (dependent variable[1]) of drinking motivational profile and sex motivational profile. Results indicated a significant difference in gender composition for sex motivational profile, $\chi^2(df=2)=18.99$, $p<.001$. The High For with Coping/Moderate Against Sex motivational profile contained more men than the High For/Low Against Sex motivational profile, $\chi^2(df=1)=18.58$, $p<.001$, which contained more men than the Low For/High Against Sex motivational profile, $\chi^2(df=1)=7.42$, $p<.01$. There were no differences in gender composition by drinking motivational profile, $\chi^2(df=2)=1.62$, $p=.44$.

**Alcohol behavior and consequences—**A 3 × 3 MANOVA tested whether alcohol use and problems differed by motivational profiles for drinking and sex (see Table 4). Dependent variables were alcohol use frequency, binge drinking frequency, and RAPI problem drinking consequences. There was a significant multivariate effect of drinking motivational profile, $F$ (6, 430) = 11.37, $p < .001$, but not of sex motivational profile, $F$ (6, 430) = 1.03, *n.s.*, and no Drinking Motivational Profile × Sex Motivational Profile interaction, $F$ (12, 648) = 1.58, *n.s*. Univariate ANOVAS showed between-subjects differences by drinking motivational profile for alcohol use, binge drinking, $F$ (2, 224) = 15.69, $p < .001$, and RAPI scores. Tukey's post-hoc comparisons revealed that individuals in the Low For/High Against Drinking profile had lower frequency of drinking and of binge drinking than the other two drinking motivational profiles. In addition, RAPI scores significantly differentiated all three motivational profiles, with the highest scores in the High For/Low Against Drinking group, intermediate scores in the Average Drinking Motives group, and lowest levels in the Low For/High Against Drinking group.

**Sexual behavior—**A similar MANOVA examining profile differences in three sexual behavior dependent variables showed a significant multivariate effect of sex motivational profile, $F$ (6, 428) = 2.75, $p < .05$. There was no effect of drinking motivational profile, $F$ (6, 428) = 0.23, *n.s.*, and no Drinking Motivational Profile × Sex Motivational Profile interaction, $F$ (12, 645) = 1., *n.s*. Univariate ANOVAs revealed between-subjects differences by sex motivational profile for lifetime vaginal sex, lifetime oral sex partners, and penetrative partners in the past 12 weeks. Tukey's post-hoc comparisons showed that individuals in the Low For/ High Against Sex motivational profile reported significantly less lifetime experience with vaginal sex and fewer oral and penetrative sexual partners compared to the two other profiles, which did not differ.

**Psychosocial adjustment—**A final MANOVA on the three indicators of psychosocial adjustment showed a multivariate effect of drinking motivational profile, $F$ (6, 432) = 2.68, $p < .05$, and a Drinking Motivational Profile × Sex Motivational Profile interaction, $F$ (12, 651) = 1.79, $p < .05$. There was no significant effect of sex motivational profile, $F$ (6, 432) = 1.49, *n.s*. As evidenced by the univariate tests, there was a between-subjects effect of drinking motivational profile for neuroticism and peer self-image. In both, Tukey's tests showed that the Average Drinking Motives group showed better adjustment than the High For/Low Against Drinking group, with the Low For/High Against Drinking group reporting intermediate adjustment that did not significantly differ from either group. In other words, the Average Drinking Motives group had lower neuroticism and more positive peer self-image compared to the High For/Low Against Drinking group.

Finally, there were Drinking Motivational Profile × Sex Motivational Profile interactions for neuroticism, $F$ (4, 225) = 3.22, $p < .05$, and self-esteem, $F$ (4, 225) = 2.47, $p < .05$ [not shown].

[1]Gender was treated as the dependent variable in this analysis to assess the gender composition of the profiles. No causal effect of profile is asserted in any of these analyses.

Among individuals in the High For/Low Against Sex group, those also in the Average Drinking Motives motivational group reported the lowest neuroticism and those in the High For/Low Against Drinking motivational group reported the highest neuroticism. The High For with Coping/Moderate Against Sex motivational group who had a Low For/High Against Drinking profile, or conflicting patterns of motivations for sex and drinking, reported the lowest self-esteem.

## Discussion

Motivational theories including the functional perspective suggest that behaviors such as frequent alcohol use and multiple sexual partners may serve different purposes for different individuals and thus alcohol use and sex represent psychologically distinct actions depending on motivations (Cooper et al., 1999; Cooper et al., 1995). This is consistent with other theories, such as the theory of reasoned action (Ajzen, 2001; Fishbein & Ajzen, 1975) and the health belief model (Becker, 1974; Champion, 1984), which highlight the importance of perceived costs and benefits of the behavior identified by individuals. In the current study, motivations for behavior were examined to identify person-centered profiles of motivations for and against alcohol use and sexual behavior. Although alcohol use and sex are different behaviors with different domains of motivations, constellations of levels of alcohol motivations and sex motivations were associated across behaviors. This builds on previous work demonstrating within-domain motivations and extends it by examining cross-behavior motivations and the associations of person-centered motivational profiles with alcohol use, sexual behavior, and psychosocial adjustment.

## Motivational Profiles and Associations with Gender and Behavior

The study addressed three main aims. First, groups of individuals with unique profiles of positive and negative motivations for alcohol use and sexual behavior were identified. Three profiles of drinking motivations were cautious about drinking, a group with average levels of motivations for drinking and for avoiding its negative consequences, and a group with high motivations for drinking accompanied by low motivations against drinking. Similarly, three profiles of sexual motivations were cautious about sexx, a group characterized by high intimacy and enhancement motivations along with health motivations against sex as important, and a group with high motivations for sex coupled with moderate motivations against sex. The existence of these profiles based on the current measures documents between-persons variation in configurations of motivations for alcohol use and sexual behavior within people.

In the second aim, we described associations between motivations for alcohol use and sex. Although positive links between drinking and sexual behaviors have been documented between people, the meaning of the association has not been specified (Cooper & Orcutt, 2000; Leigh & Stall, 1993). Furthermore, within-person or event-level associations in behavior (i.e., using alcohol before sexual activity) are not conclusive (e.g., Cooper, 2006; Patrick & Maggs, 2009). The authors are aware of no previous research linking motivations for alcohol use with motivations for sexual behavior, particularly using person-centered analyses. In the present study, cross-motivation associations were found, such that people who had motivational profiles with concern about drinking were more likely to also hold cautious sex motivational profiles. Individuals with equivalent but potentially conflicting motivations for drinking and not drinking also tended to have a more moderate sex motivational profile (i.e., similar levels of motivations for and against sex). In addition, individuals who had high levels of motivations for sex were most likely to have either average motivations for drinking or high motivations for drinking. However, neither the behaviors nor the motivations are perfectly correlated; that is, there appear to be both distinct and overlapping motivational structures for alcohol use and sexual behavior.

The third aim focused on the differential levels of risk behavior across motivational profiles by examining profile membership by gender, alcohol use and problems, sexual behavior, and adjustment. The gender composition of the sex motivational profiles (but not those for drinking motivational profiles) differed, with more men in groups characterized by higher motivations to have sex. More importantly for level of health risk, profiles were also associated with behavior. Overall, motivational profiles were associated with behaviors within-domain. That is, drinking motivational profile predicted frequency of alcohol use and heavy alcohol use as well as alcohol problems; sex motivational profiles predicted lifetime sexual experience and number of oral and penetrative sexual partners. Finally, there was an association of motivational profiles with psychosocial adjustment, such that individuals with motivational profiles including the highest motivations for drinking evidenced the highest levels of neuroticism and lowest levels of peer self-image. This same pattern has been found previously, with moderate drinkers having the most positive outcomes (Gunzerath, Faden, Zakhari, & Warren, 2004).

The two profiles with high levels of motivations for the behaviors may be conceptually considered to be the most vulnerable to negative outcomes, given the possible facilitative effects of alcohol use on risky sexual behavior (Cooper, 2002; Kaly, Heesacker, & Frost, 2002; Leigh, 1999). Previous research using variable-centered analyses has noted the increased risk of negative consequences among individuals with coping motivations for drinking and for sex (Cooper et al., 1995; Cox & Klinger, 1988; Hussong, Hicks, Levy, & Curran, 2001; Kuntsche et al., 2005) and evidence that individuals who engage in risk behaviors to cope may be at greater risk for clinical abuse and dependence (Cox & Klinger, 1988). The present findings are consistent with this pattern, with higher negative alcohol-related consequences, lower peer self-image, and higher neuroticism among individuals highly motivated to drink (including coping motivations). However, those with high levels of motivations to have sex (including coping motiations) were not significantly different than those with high motivations for and low motivations against sex on indicators of sexual behavior or adjustment. This may be the result of utilizing a non-clinical sample of college students, rather than focusing on individuals selected for their manifestation of negative consequences or signs of future problems.

Future research should address the possibility that the increased risk for greater health consequences manifests itself more strongly over longer periods of development. The motivational profile may be a prospective predictor of alcohol- and sex-related health outcomes as individuals move across relationships and into adulthood. In addition, there were significant interactions of profiles for alcohol use motivations and profiles for sexual behavior motivations, indicating important cross-behavior prediction. For example, a particularly high level of neuroticism was found among individuals who were both characterized by high motivations for sex and high motivations for drinking, which may reflect a higher-order third variable effect of personality (e.g., neuroticism) or mental health problems (e.g., anxiety). Future research investigating cross-behavioral consequences is therefore warranted.

## Intervention Implications

The existence of distinct profiles of motivations for alcohol use and sexual behavior implies the need for intervention programs targeted to individuals with different reasons for engaging in risk behaviors. For example, for individuals who have a profile of motivations for drinking that is characterized by drinking to have fun and share social experiences, to relax, and to maintain a certain reputation, an intervention could address potential strategies for enjoying themselves while exercising harm reduction (e.g., spacing drinks). A profile of motivations for sex that includes using sexual intimacy to cope with negative affect or to escape from stressful situations might require an intervention for adolescents and college students with a focus on managing anxiety in healthier and more diverse ways (e.g., problem-focused coping strategies),

to reduce vulnerability to loneliness that may lead to many or poorly selected sexual partners. The most effective intervention approach for individuals characterized by different motivational profiles, therefore, could be different. These findings suggest that individuals who have different configurations of motivations for alcohol use and sexual behaviors may also be at higher or lower risk for negative consequences associated with these behaviors and for more general mental health problems. In addition, those individuals who have the riskiest motivational profiles for alcohol use motivations also tend to have motivational profiles for sex that are associated with riskier sexual behaviors. Although relations between motivations and behaviors are likely bidirectional and reciprocal, self-reported motivations may be used to identify and target individuals for intervention programs. If replicated, these results may be used to inform intervention approaches that identify individuals at risk for multiple negative outcomes, including risk behaviors and mental health disorders, to support positive overall health among college students.

## Strengths and Limitations

Previous studies focused on drinking motivations have used variable-centered approaches and primarily focused on positive motivations for alcohol use. Therefore, the current study advances the literature by including: (a) drinking motivations and sexual behavior motivations in the same study; (b) motivations not to use alcohol and not to have sex for a more complete picture of the complexity of patterns of motivations; and (c) a person-centered approach to examine how motivations are configured within people. Rather than focusing on motivational dimensions independently, person-centered approaches allow for complex higher-order interactions in associations to be uncovered (Bauer & Shanahan, 2007). Limitations of the study include the cross-sectional design which makes it impossible to test bidirectional effects and the single cohort of a college-aged sample. Our findings regarding motivations may be particular to the measures used in this study. Measurement limitations include a lack of potentially important covariates such as socioeconomic status indicators, relationship with parents, desire for peer approval, depression, and recent oral sex frequency. In addition, situational predictors of motivations for alcohol use, sexual behavior, and their co-occurrence were not assessed. Finally, the sample size limited the ability to detect complicated interactions of gender, ethnicity, and the motivational profiles, which is a necessary step for future research. However, strengths of the study, including its innovative questions and analytic methods, racially and ethnically diverse sample, high response rate, and quality of measures, help to mitigate these limitations.

## Future Directions

There is evidence for profiles of motivations for alcohol use and sexual behavior that are concurrently related to the behaviors themselves. Although between-persons associations of alcohol use and sexual behavior have been demonstrated, more empirical data on within-person relationships of motivations for these behaviors and the extent to which they co-occur is needed. We found a relatively small association for alcohol use and sexual behavior motivations, and future research should address these questions by assessing the same motivational domains for drinking and sexual behavior. Future studies should replicate these profiles in other populations with different measures including a more diverse range of motivations to address whether person-centered motivational types predict the development of these behaviors over time, contexts, relationships, and behavioral domains (i.e., whether having motivations to drink for sex is predictive of riskier sexual behavior). Developmentally, motivational profiles may change over time as adolescents and young adults mature, across life transitions (e.g., graduation from college, marriage), and in response to specific experiences (i.e., a new romantic relationship). In addition, there may be reciprocal relationships between motivations and behavior that should be assessed using longitudinal data. Understanding the composition

and development of motivational profiles may prove to be a fruitful field of investigation. Evidence regarding how the same individuals experience and weigh both positive and negative motivations for and motivations against a behavior will be foundational for designing intervention programs that can appropriately address the whole individual and help to reduce some of the risks associated with heavy drinking and unsafe sexual activity during the college years.

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**Table 1**

Scale Means (Standard Deviations) by Drinking Motivational Profile

| | Low For/High Against Drinking | Average Drinking Motives | High For/Low Against Drinking | Full Sample |
|---|---|---|---|---|
| | 34.1% | 53.3% | 12.7% | 100.0% |
| | M (SD) | M (SD) | M (SD) | M (SD) |
| Motivations For Drinking | | | | |
| Fun/Social | 0.35 (0.50) | 2.42 (0.61) | 2.84 (0.57) | 1.73 (1.19) |
| Relaxation/Coping | 0.22 (0.36) | 1.31 (0.90) | 2.01 (0.96) | 1.00 (0.99) |
| Image | 0.10 (0.28) | 0.73 (0.74) | 1.71 (0.85) | 0.62 (0.80) |
| Sex | 0.03 (0.17) | 0.28 (0.45) | 2.50 (0.69) | 0.47 (0.88) |
| Motivations Against Drinking | | | | |
| Physical | 3.63 (0.73) | 2.75 (0.93) | 2.50 (1.19) | 2.95 (1.09) |
| Behavioral | 3.75 (0.52) | 3.21 (0.68) | 3.06 (0.96) | 3.30 (0.87) |

*Note*. Possible range for all motivations scales 0 (not important to me) to 4 (very important to me).

**Table 2**

Scale Means (Standard Deviations) by Sex Motivational Profile

| | Low For/High Against Sex | High For/Low Against Sex | High For with Coping/Moderate Against Sex | Full Sample |
|---|---|---|---|---|
| | 35.3% | 41.8% | 22.8% | 100.0% |
| | M (SD) | M (SD) | M (SD) | M (SD) |
| Motivations For Sex | | | | |
| Intimacy | 1.57 (1.16) | 2.72 (0.85) | 2.69 (0.82) | 2.31 (1.11) |
| Enhancement | 0.75 (0.62) | 2.16 (0.83) | 2.85 (0.75) | 1.82 (1.12) |
| Coping | 0.17 (0.30) | 0.41 (0.43) | 2.02 (0.58) | 0.69 (0.85) |
| Motivations Against Sex | | | | |
| Not Ready | 2.74 (1.06) | 1.28 (1.00) | 1.80 (1.03) | 1.91 (1.21) |
| Health | 3.62 (0.68) | 2.85 (0.98) | 3.30 (0.81) | 3.22 (0.91) |
| Values | 2.68 (1.19) | 0.77 (0.80) | 1.39 (1.19) | 1.59 (1.34) |

*Note*. Possible range for all motivations scales 0 (not important to me) to 4 (very important to me).

## Table 3

Cross-tabs of Drinking Motivational Profiles by Sex Motivational Profiles

| | Sex Motivational Profile | | |
|---|---|---|---|
| **Drinking Motivational Profile** | **Low For/High Against Sex % of total (*n*)** | **High For/Low Against Sex % of total (*n*)** | **Hi For with Coping/Moderate Against Sex % of total (*n*)** |
| Low For/High Against Drinking | 18.5 (42) | 11.0 (25) | 4.0 (9) |
| Average Drinking Motives | 15.0 (34) | 26.9 (61) | 11.9 (27) |
| High For/Low Against Drinking | 0.4 (1) | 4.8 (11) | 7.5 (17) |

*Note*. $\chi^2$ (4, $N$ = 227) = 42.69, $p < .001$.

**Table 4**

Alcohol Use, Sexual Behavior, and Psychosocial Adjustment Means by Drinking and Sex Motivational Profiles

| | Drinking Motivational Profiles | | | | Sex Motivational Profiles | | | |
|---|---|---|---|---|---|---|---|---|
| | Lo For/Hi Against M (SD) | Average Motives M (SD) | Hi For/Lo Against M (SD) | F | Lo For/Hi Against M (SD) | Hi For/Lo Against M (SD) | Hi For w/Coping/Moderate Against M (SD) | F |
| Alcohol Use | | | | | | | | |
| Alcohol Frequency | 1.11 (1.48)[a] | 3.56 (1.47)[b] | 3.75 (1.60)[b] | 39.25*** | 2.11 (2.02)[a] | 3.16 (1.78)[b] | 3.00 (1.66)[b] | 2.42 |
| Binge Frequency | 0.33 (.74)[a] | 1.56 (1.44)[b] | 1.71 (1.46)[b] | 15.69*** | 0.99 (1.35) | 1.31 (1.43) | 1.17 (1.33) | 0.51 |
| RAPI | 0.09 (.18)[a] | 0.38 (.40)[b] | 0.61 (.56)[c] | 9.82*** | 0.24 (.40) | 0.33 (.38) | 0.36 (.46) | 1.62 |
| Sexual Behavior | | | | | | | | |
| Ever Vaginal Sex | 0.49 (.50)[a] | 0.67 (.47)[a,b] | 0.76 (.44)[b] | 0.30 | 0.38 (.49)[a] | 0.77 (.42)[b] | 0.69 (.47)[b] | 4.82** |
| Oral Partners | 1.28 (1.68)[a] | 1.93 (2.00)[a,b] | 2.59 (2.16)[b] | 0.02 | 0.95 (1.32)[a] | 2.15 (1.91)[b] | 2.38 (2.42)[b] | 3.79* |
| Penetrative Partners | 0.44 (.64) | 0.68 (.84) | 0.59 (.68) | 0.49 | 0.26 (.47)[a] | 0.72 (.80)[b] | 0.81 (.89)[b] | 3.38* |
| Psychosocial Adjustment | | | | | | | | |
| Neuroticism | 1.72 (0.85)[a] | 1.55 (.61)[a] | 2.00 (.73)[b] | 3.39* | 1.63 (.67) | 1.60 (.79) | 1.81 (.70) | 0.18 |
| Peer Self-image | 3.57 (.78)[a,b] | 3.83 (.64)[a] | 3.40 (.77)[b] | 6.36** | 3.75 (.73) | 3.76 (.71) | 3.49 (.70) | 1.51 |
| Self-esteem | 3.13 (.62) | 3.10 (.53) | 2.95 (.56) | 2.35 | 3.16 (.55)[a] | 3.14 (.50)[a] | 2.89 (.67)[b] | 3.94* |

*Note.* Entries with different superscripts indicate significant Tukey's post-hoc differences at $p < .05$. To protect against Type I error, only significant differences preceded by multivariate and univariate ANOVA tests are discussed in the text.