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Predictors of Heavy Drinking and Drinking Problems over the First Four Years of Marriage

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Abstract

This study investigated the factors predictive of heavy drinking and drinking problems over the early years of marriage, focusing on the premarital drinking and relatively stable individual risk and protective factors that were present prior to marriage, and on social-interpersonal factors that may change or emerge over marriage. Newlywed couples were assessed at the time of marriage, and at the 1st, 2nd, and 4th anniversaries with respect to frequency of heavy drinking and the extent of drinking problems, and a variety of factors that have been found to be predictive of adult alcohol problems. The results indicated that antisocial characteristics, family history of alcoholism, negative affect, and alcohol expectancies were related to heavy drinking and alcohol problems at the time of marriage. Changes after marriage were predicted by the drinking of one's partner and of one's peers and by alcohol expectancies for social/physical pleasure for both men and women. In addition, the quality of the marriage was longitudinally protective from the experience of alcohol problems for both men and women, although it was not related to changes in heavy drinking.

Keywords

Alcohol Problems; Drinking Patterns; Marital Functioning; Partner Influence; Peer Influence

Theoretical approaches to excessive drinking and alcohol problems have shifted from risk factor and person-environment interaction models to probabilistic-developmental models (e.g., Zucker, 2004) that incorporate person-environmental interactions into a broader developmental psychopathology approach (Windle & Davies, 1999). These models emphasize an array of biological, psychological, and social processes, sometimes acting in concert and sometimes in opposition to each other. This model argues that alcohol use and alcohol problems both affect and are affected by maturational processes and phase-specific transitional events. As Zucker, Fitzgerald, and Moses (1995) stated, "Within such a framework . . . one can conceive of risk as a fluid characteristic which increases or decreases depending upon the interplay of ongoing trajectory . . . and the influence of new external and

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internal (stage triggered) causative agents” (p. 686). From this perspective, understanding the development of heavy drinking and alcohol problems is fostered by focusing on transitional events, particularly those that introduce, remove, or reorganize the biological, psychological, or social influences on drinking.

One of the most important psychosocial transitional events is marriage, an event experienced by more than 70% of men and women by age 35 (Fields, 2003). Marriage carries with it a variety of tasks that can fundamentally alter an individual's view of self, as well as how the broader social network behaves toward the individual and the couple. At the psychological level, there is often a marked shift away from more individualistic values and toward more interdependent and socially positive values, consistent with the adoption of the new role of spouse. There is also often a major reorganization of the social network involving the reestablishment or redefinition of ties, both as individuals and as a couple, with each member's extended family and peer network (Boss, 1983; McGoldrick & Carter, 1982).

In addition to these psycho-social changes, it has been long recognized that marriage is associated with a reduced risk for alcoholism and alcohol problems (Bacon, 1944; Poikolainen, 1983). Epidemiological studies have consistently demonstrated that the rate of alcohol problems among married men and women is substantially less than the rate among single and divorced men and women. While these differences could occur because of differential selection into and out of marriage, longitudinal research has demonstrated that the transition to marriage does, in fact, serve a protective function, not only with respect to heavy drinking (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Miller-Tutzauer, Leonard, & Windle, 1991), but also with respect to alcohol problems and alcohol disorders (Chilcoat & Breslau, 1996).

Although marriage leads to decreased heavy drinking and alcohol problems, not all couples experience this protective effect. For example, among current drinkers, 11% of married men and 5% of married women met criteria for an alcohol disorder in the preceding year (NIAAA, 2006). Chilcoat and Breslau (1996) assessed approximately 1000 young adult members of an HMO at age 21-30 and re-interviewed them three and a half years later. Among subjects who had an alcohol diagnosis at baseline, nearly one quarter of those who married continued to have an alcohol diagnosis at follow-up. Among those who stayed single, more than 50% continued to have an alcohol diagnosis at follow-up. These data, while supportive of the protective effects of marriage, nonetheless point to the fact that a sizeable proportion of individuals experience continued or new alcohol problems after marriage.

Understanding the processes underlying the protective effects of marriage, and particularly, determining factors that differentiate individuals who reduce their drinking and drinking problems over marriage from those who do not is of vital importance. Those who fail to moderate their alcohol use in response to this developmentally normative event are likely to be at greater risk for further problems associated with drinking. Moreover, the failure to reduce drinking, particularly in the context of a partner who is or who becomes a light drinker, has the potential to jeopardize the marital relationship (Homish & Leonard, 2007). From the probabilistic-developmental approach, drinking and alcohol problems subsequent

to a developmental transition will be influenced by the preceding risk status, relatively stable individual risk and protective factors that were present prior to the transition, and by social-interpersonal factors that may change or emerge over the transition.

Alcohol Risk Trajectory

Those who manifest heavy drinking and alcohol problems after marriage are likely to be those who engaged in these behaviors prior to marriage. Such continuity, particularly in the absence of other significant predictors of postmarriage alcohol problems, would suggest a correspondence between premarital and postmarital risk factors for alcohol problems. Longitudinal studies suggest that while there is considerable discontinuity of drinking behavior over time, there is some modest stability, even among young adults (Donovan, Jessor, & Jessor, 1983; Fillmore & Midanik, 1983). Over the transition to marriage, Leonard and Mudar (2004) found that premarital heavy drinking was strongly predictive of heavy drinking in the first year of marriage, with standardized regression coefficients of .65 for men and .54 for women.

Individual Risk Characteristics

Individual risk characteristics may be predictive of heavy drinking and alcohol problems after marriage independent of their effect before marriage. Risks for alcoholism prior to marriage may be masked by social/contextual factors that support normative heavy drinking in young adults. When the social/contextual influences wane, other causes of heavy drinking and alcohol problems could emerge. At a more complex level, the traditional risk factors for alcoholism might mitigate the effectiveness of the other factors pressing for a reduction in drinking at the time of marriage. We focus on four major constructs of importance: family history of alcoholism, socialization, negative affect, and alcohol expectancies. Although there are other factors that have been linked to alcohol problems, these four constructs have considerable research evidence documenting the association, as well as longitudinal research demonstrating prospective relationships (see Sher, Grekin, & Williams, 2005). However, the role of these factors has largely been studied in long-term longitudinal studies, and it is unclear which ones operate across specific developmental transitions (Windle & Davies, 1999).

Social-interpersonal influences

Despite strong evidence of peer influences on drinking in adolescence (e.g., Brook & Brook, 1990; Kandel & Andrews, 1987), the evidence for peer influence among adults is weak. Several cross-sectional studies have found associations between drinking of adults and their peers (Fromme & Ruela, 1994; Leonard & Mudar, 2000), but longitudinal studies have failed to find a peer influence effect (Bullers, Cooper, & Russell, 2001; Labouvie, 1996). In our earlier study of peer influence from premarriage to the first anniversary, there was also no longitudinal evidence of peer influences; however, there were strong cross-sectional relationships (Leonard & Mudar, 2003). Given that the peer network changed substantially over the transition to marriage, longitudinal effects may not occur until the second or subsequent anniversaries.

Although the drinking of peers has not been shown to impact adult drinking, spouse drinking has been shown to be longitudinally predictive. There have been contradictory findings in studies with different populations and methods (e.g., Holmila, 1988; Wilsnack, Wilsnack, & Klassen, 1987); however, we have found support for partner influence in two independent samples of newlyweds (Leonard & Eiden, 1999; Leonard & Mudar, 2003). In both studies, husbands' alcohol use before marriage was predictive of wives' drinking in the year after marriage, but wives' drinking was not predictive of husbands' subsequent drinking. In a subsequent analysis, we found wives' drinking at the first anniversary was predictive of husbands' drinking at the second anniversary, while husband to wife influence was not apparent.

Research has also examined whether marital quality impacts drinking. In treatment samples, there is considerable evidence that men in more satisfying marriages are more likely to have successful treatment outcomes (e.g., Maisto, McKay, & O'Farrell, 1998; McCrady et al., 1986). However, there are few studies of general population samples that examine whether marital satisfaction impacts drinking or drinking problems. Kearns-Bodkin and Leonard (2005) utilized linear growth models and found that changes in heavy drinking correlated with changes in marital satisfaction, but there was no evidence of a longitudinal impact. In contrast, Whisman et al. (2006) examined almost 1700 married men and women without a current alcohol disorder. Over 12 months, baseline marital dissatisfaction predicted the occurrence of an alcohol disorder after controlling for lifetime alcohol disorders.

The Current Study

In sum, the available empirical literature suggests that the early adult transitions to marriage are associated with declines in alcohol consumption and alcohol problems. These transitions are also associated with major structural and psychological changes at the individual, couple, and social network levels. However, there is little research that examines the direct and indirect influences of these individual, couple, and social characteristics on risky or problem drinking. The current study is based on a longitudinal study of drinking and drinking problems over the early years of marriage (Leonard & Mudar, 2003, 2004). In earlier analyses, we focused on predictors of heavy drinking from premarriage to the first anniversary. In this analysis, we examine individual, couple, and peer predictors over the first four years of marriage. In addition, we explore these predictors with respect to both heavy drinking as well as the experience of alcohol problems.

Method

Participants

Participants were involved in a longitudinal study of marriage. All participants were at least 18 years old, spoke English, and were literate. Couples were ineligible for the study if they had been previously married. These analyses are based on 634 couples. At the initial assessment, the average age of the men [mean (SD)] was 28.7 (6.3) years and the average of the women was 26.8 (5.8) years. The majority of the men and women in the sample were European American (husbands: 59%; wives: 62%). About one-third of the sample was African American (husbands: 33%; wives: 31%). The sample included small percentages

(less than 5%) of Hispanic, Asian, and Native American participants. A large proportion of husbands and wives had some college education (husbands: 64%; wives: 69%) and most were employed at least part-time (husbands: 89%; wives 75%). Consistent with other studies of newly married couples (e.g., Orbach & Veroff, 2002; Tallman, Burke, & Gecas, 1998), many of the couples were parents at the time of marriage (38% of the husbands and 43% of the wives) and were living together prior to marriage (70%). The Institutional Review Board of the State University of New York at Buffalo approved the research protocol.

Procedures

After applying for a marriage license, couples were recruited for a 5-10 minute paid (\$10) interview. The interview covered demographic factors (e.g., race, education, age), family and relationship factors (e.g., number of children, length of engagement), and substance use questions (e.g., tobacco use, average alcohol consumption, times intoxicated in the past year). Recruitment occurred over a 3-year period from 1996-1999. For interested individuals who did not have time to complete this interview, a telephone interview was conducted later that day or the next day ($N = 62$). Less than 8% of individuals approached declined to participate. We interviewed 970 eligible couples.

Complete details of the recruitment process can be found elsewhere (Leonard & Mudar, 2000, 2003), but briefly, couples who agreed to participate were given identical questionnaires to complete at home and asked to return them in separate postage paid envelopes (Wave 1 Assessment). Participants were asked not to discuss their responses with their partners. Each spouse received \$40 for his or her participation. Only 7% of eligible couples refused to participate. Those who agreed to participate, compared to those who did not, had lower incomes ($p < .01$) and the women were more likely to have children ($p < .01$). No other differences were identified. Of the 887 eligible couples who agreed to participate (13 of the original 900 did not marry); data were collected from both spouses for 634 couples (71.4%). The 634 couples are the basis for this report. Couples who returned the questionnaires were more likely to be living together compared to couples who did not return the questionnaires (70% vs. 62%; $p < .05$) and more likely to be European American. No other sociodemographic differences existed between the couples who responded compared to those who did not. Average past year alcohol consumption did not differ between couples that returned the questionnaires and those who did not. Non-respondent husbands consumed 6 or more drinks or were intoxicated more often than husbands who completed the questionnaire; however, these differences were small.

At the couples' first, second and fourth wedding anniversaries (Waves 2, 3 and 4), they were mailed questionnaires similar to those they received at the first assessments. Waves 5 (7th anniversary) and 6 (9th anniversary) are currently being completed. Again, they were asked to complete the questionnaires and return them in the postage paid envelopes. Each spouse received \$40 for his or her participation for the first 3 assessments and \$50 each for the fourth assessment. We maintained 91%, 85%, and 81% of wives and 86%, 79%, and 71% of husbands at Waves 2, 3, and 4, respectively. Only one factor differentiated Wave 4 participants from dropouts. Wives who dropped out reported a greater frequency of heavy

drinking at Wave 1 compared to participating wives ($p < .05$); however, this difference was quite small.

Measures: Outcome Variables

Heavy Drinking—At each wave, heavy drinking was assessed with two items. Frequency of past year intoxication was assessed on a 9-point scale that ranged from “didn’t get drunk last year” (coded 0) to “everyday” (coded 8). The frequency of drinking 6 or more drinks on an occasion in the past year was also assessed using the same 9-point scale. Following our earlier work (Homish & Leonard, 2007) heavy drinking was defined as the maximum of these two responses. This variable was the outcome variable for the first set of models (as described below). Baseline (Wave 1) level of heavy drinking was modeled as a time-invariant covariate to capture premarital heavy drinking.

Alcohol Problems—Alcohol problems in the past year were assessed for husbands and wives using 25 items that were modified from the National Alcohol Survey (Clark & Hilton, 1991), the Drinker Inventory of Consequences (Miller & Tonigan, 1995), and the work of Polich and Orvis (1979). The measure consists of both alcohol-related marital problems (e.g., “hit or got into a physical fight with your partner while you were drinking”, “said harsh or cruel things to your partner while you were drinking”, “gotten angry about your drinking or the way you behaved while you were drinking”, “avoided being around you because of your drinking”, “excluded you from activities because of your drinking”) and alcohol-related other problems (“driven a car after drinking enough to be in trouble if a police officer has stopped you”, “had your drinking hurt your chances for promotion, or raises, or better jobs”, “hit or gotten into a physical fight with someone other than your partner while you were drinking”, “had your friends complain or express concern about your drinking”). Participants were asked to rate how often each of these problems occurred. They could indicate that the problem had never occurred, that it had not occurred in the past year, both of which received a score of “0”, or that it had occurred “once”, “twice”, “three times” or “four or more times” in the past year. These items were summed leading to potential scores between 0 and 100, with higher scores indicating a greater number of total occurrences of alcohol problems. The alcohol problems scale had good reliability among husbands and wives (alphas = .92, .90, respectively). Alcohol problems was the outcome variable for the second set of models. Baseline (Wave 1) alcohol problems were modeled as a time-invariant covariate and heavy drinking was modeled as a time-varying covariate in these models.

Measures: Predictor Variables

Social Network Variables—At each assessment, husbands and wives listed up to 23 individual in their social networks. These individuals were defined as people who provided emotional support, helped with practical or financial matters, or people with whom they socialized. Preliminary analyses indicated that the total number of individuals in the social network was not predictive of drinking or drinking problems. For each member, participants reported on several characteristics (e.g., demographics, rate/type of contact) as well as specific alcohol-related questions. Two measures were based on this assessment. Subjects were asked to identify social network members who were heavy drinkers, problem drinkers,

or alcoholics, although we did not define this further. In addition, participants received a definition of “drinking buddy”, and were asked to identify members who were drinking buddies. We used both the number of heavy drinkers and the number of drinking buddies as time-varying predictors in the model because there is evidence that these two constructs may have independent effects (Reifman, Watson, & McCourt, 2006).

Parental Alcoholism—Maternal and paternal history of alcoholism was assessed at Wave 1 using a version of the Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978) that was modified by Domenico and Windle (1993). A biological parent was categorized as having an alcohol problem if the participant reported that he/she ever had a serious problem with drinking and had at least one alcohol-related problem. For the current report, an affirmative response for either father or mother was considered a positive family history of alcoholism. This was a time-invariant predictor in the regression model.

Negative Affect—The Big Five Inventory (BFI; John, 1990) was completed at each wave. The 8-item Neuroticism subscale was used to measure negative affect. The items are scored on a 5-point scale anchored by “Disagree Strongly” and “Agree Strongly.” Higher scores represent higher levels of negative affect. The average reliability across the four waves of the study was .85 for wives and .83 for husbands. An extensive psychometric evaluation by John and Srivastava (1999) found that Neuroticism on the BFI was very strongly correlated with Neuroticism on the NEO-PI (Costa & McCrae, 1985) with convergent validity of .90 after correcting for reliabilities of the two scales. Watson and Humrichouse (2006) found that the BFI Neuroticism scale was strongly correlated ($r=.64$) with the Negative Affect Scale of the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988), and that participants’ scores on the BFI Neuroticism scale were highly correlated with a spouse report version of the BFI ($r=.62$). This variable was a time-varying predictor in the regression analyses.

Alcohol Expectancies—The items comprising the Global Positive factor (GP), Social/Physical Pleasure factor (SPP), and the Power and Aggression factor (PA) of the Alcohol Effects Questionnaire (AEQ, Rohsenow, 1983) were employed in this study. The true/false response format of the original measure was modified to a five-point agree/disagree scale and participants responded according to their own personal beliefs about alcohol's effects. The scales had a high reliability across all waves of the study (average of coefficient alphas across the four waves for the men: .90; among women: .89). The three alcohol expectancies scales were modeled as time-varying predictors in the analysis.

Antisocial Behavior—Antisocial behavior was assessed at Wave 1 using 28 items from the Antisocial Behavior Checklist (ABC, Zucker & Noll, 1980). The ABC assesses frequency of childhood (e.g., suspended from school) and adult (e.g., defaulted on a debt) antisocial behaviors using a 4-point scale (1 = never, 4 = often or more than 10 times). Coefficient alphas were high for both the husbands (.90) and wives (.86). Antisocial behavior was modeled as a time-invariant predictor.

Relationship Quality—At each assessment, overall marital quality was assessed with the 15 item Marital Adjustment Test (MAT; Locke & Wallace, 1959). Higher scores indicated

greater relationship quality (range: 2-158). The MAT had an adequate reliability across all waves of the study (average of coefficient alphas across the four waves for the men: .79; among women: .78). The MAT score was standardized for the regression models and was entered as a time-varying predictor in the analysis.

Demographic Factors—At the screening interview, each spouse reported their age, race/ethnicity, income, highest level of education, employment status, number of children, and the number of months cohabitating. These variables were modeled as time-invariant covariates in the regression model. Past year pregnancy (yes/no) was entered as a time varying covariate in the models.

Analysis

Descriptive statistics were used to characterize the outcome variables for husbands and wives at each wave. The outcome variables were also examined longitudinally with a repeated measures ANOVA. Correlations were used to assess the relation between husbands' and wives' heavy drinking and alcohol problems at each wave. Additionally, correlations were used to examine the interrelationship between husband predictors, wife predictors, and the outcome variables. To identify predictors of heavy drinking and alcohol problems over time, we used Generalized Estimating Equations (GEE) (Zeger & Liang, 1986; Zeger, Liang, & Albert, 1988). GEE models are used to analyze data from longitudinal designs with discrete or continuous outcomes (Zeger et al., 1988). Because longitudinal datasets contain repeated observations of the same participants over time, the data is often correlated; thus requiring more specialized analytic tools. GEE models can be used to assess the longitudinal relationship between several time-varying and time-invariant predictors and the outcome variable (Twisk, 2004). In addition to appropriately handling correlated data structures, GEE models are also useful for dealing with cases with missing observations. For many other analysis (e.g., repeated measures ANOVA's), participants who do not provide data for each assessment are considered missing; however, GEE modeling allows participants with only information from one assessment to be included in the analyses (Twisk, 2004). The nature of the missing data must be missing at random for the parameter estimates and standard errors to be unbiased.

For the current report, two sets of GEE models were analyzed. For the first set of models, the outcome was the frequency of heavy drinking, with separate models for husbands' and wives' heavy drinking. In the second set of models, the outcome was the number of alcohol problems over time. Again, separate models were specified for husbands and wives. All models were analyzed with Stata (Version 8, StataCorp, 2003). Because the outcome variables are a count variable (i.e., how often engaged in heavy drinking and the number of alcohol problems), a Negative Binomial Family and Log Link was specified within the GEE models. The restrictive assumptions of a Poisson model made the negative binomial model a more appropriate choice (Byers, Allore, Gill, & Peduzzi, 2003; Gardner, Mulvey, & Shaw, 1995). An autoregressive correlation structure with a lag of 1 was specified along with robust standard errors. The robust standard errors are used so that if the nature of the correlation structure is not correctly specified, the standard errors will still be valid (StataCorp, 2003). Risk Ratios were reported. Risk ratios are a measure of the association

between a predictor variable and an outcome. Risk Ratios that are greater than 1 are interpreted as increasing the likelihood of an outcome (i.e., increasing risk). For example, a Risk Ratio of 1.05 for a predictor indicates a 5% increase in the criterion for each unit increase in the predictor. Risk ratios less than 1 are interpreted as decreasing the likelihood of an outcome (i.e., protective). A Risk Ratio of .90 would indicate a 10% decrease in risk for each unit increase in the predictor. Risk Ratios that are equal to 1 are not significantly associated with either increased or decreased risk.

Results

At each wave, about one-third of the husbands and almost half of the wives reported not engaging in heavy drinking in the past year (Table 1). For both husbands and wives, the frequency of heavy drinking declined significantly by Wave 4 (Table 1; for husbands, $p < .01$; for wives, $p < .05$). Similarly, the number of alcohol problems also declined over time for both husbands and wives (Table 1; husbands, $p < .01$; wives, $p < .01$). Husbands' and wives' values on the alcohol variables were significantly correlated at each wave (average correlation, $r = .33$, $p < .001$ for drinking; average correlation, $r = .23$, $p < .001$ for alcohol problems). Husbands' heavy drinking and number of alcohol problems were significantly correlated at each wave (average correlation, $r = .58$, $p < .01$), as were wives' heavy drinking and alcohol problems (average correlation, $r = .52$, $p < .01$). Table 2 presents the correlations for the husband predictor variables and for the wife predictor variables at Wave 1. The associations between all of the substantive predictor variables and the husband and wife drinking and drinking problems at baseline are presented in Table 3.

Analysis 1: Predicting Heavy Drinking

Two GEE models were used to identify time-varying and time-invariant (i.e., baseline) predictors of heavy drinking. The first model considered husbands' heavy drinking as the outcome and the second model's outcome was wives' heavy drinking. In both models, the predictors were entered simultaneously and demographic variables were entered as control variables. Baseline (Wave 1) heavy drinking was entered as a covariate.

Heavy Drinking among Husbands—In the model predicting husband's heavy drinking, several individual, partner, and social network predictors emerged. Husband's heavy drinking at baseline was associated with greater risk for continued heavy drinking (Risk Ratio [RR] = 1.22, $p < .001$; Table 4, left columns). Husbands' baseline level (Wave 1) of antisocial behaviors was positively associated with the frequency of heavy drinking over time at a trend level (RR = 1.08, $p = .07$). Husbands' scores on the Social/Physical Pleasure subscale of the AEQ were also related to heavy drinking (RR = 1.12, $p < .001$). Wives' heavy drinking was significantly associated with husbands' heavy drinking (RR = 1.06, $p < .001$). A larger number of “drinking buddies” was also associated with greater frequency of heavy drinking (RR = 1.02, $p < .001$). Husbands who were employed were less likely to report heavy drinking (RR = 0.97, $p < .05$). None of the other predictors was significant in the model.

Heavy Drinking among Wives—Wives' baseline heavy drinking was related to greater risk of continued heavy drinking ($RR = 1.25, p < .001$; Table 5, left columns). Similar to the model predicting husbands' heavy drinking, wives' baseline antisocial behaviors were related to a greater risk for heavy drinking ($RR = 1.19, p < .01$). Wives' scores on the Global Positive and the Social/Physical Pleasure factors of the AEQ were also associated with greater risk of heavy drinking (Global Positive: $RR = 1.05, p < .05$; Social/Physical Pleasure: $RR = 1.08, p < .001$). Women who reported being pregnant in the previous year were significantly less likely to engage in heavy drinking ($RR = 0.93, p < .01$). Husbands' frequency of heavy drinking was associated with increased risk for wives' heavy drinking ($RR = 1.05, p < .001$). Larger social network of "drinking buddies" and heavy drinkers for wives increased their risk of heavy drinking ("drinking buddies:" $RR = 1.03, p < .001$; heavy drinkers: $RR = 1.02, p < .01$). None of the other predictors was significant in the model.

Analysis 2: Predicting Alcohol Problems

In the second analysis, husbands' and wives' number of alcohol problems were the outcome variables. As in the first models, the predictors were entered simultaneously and demographic variables were entered as control variables. Baseline (Wave 1) alcohol problems were modeled as a covariate and heavy drinking was modeled as a time-varying covariate in these models.

Alcohol Problems among Husbands—As with the models of heavy drinking, husbands' baseline alcohol problems were associated with greater likelihood of maintaining alcohol problems over time ($RR = 1.09$, Table 4, right columns). In addition, husbands' heavy drinking also increased the risk for alcohol problems after marriage ($RR = 1.37, p < .001$). In terms of individual risk factors, higher levels of husbands' negative affect increased the risk for alcohol problems at a trend level ($RR = 1.13, p = 0.08$). Husbands' scores on the SPP subscale of the AEQ ($RR = 1.29, p < .001$) as well as scores on the PA subscale ($RR = 1.33, p < .001$) were significantly associated with husbands' alcohol problems. Among husbands, higher levels of marital satisfaction were associated with decreased risk for alcohol problems over time such that a one standard deviation increase in MAT score was associated with a 13% reduction in alcohol problems ($RR = 0.87, p < .01$). There was also evidence for influence of spouses and peers on husbands' alcohol problems. Wives' alcohol problems increased the risk of husbands' alcohol problems ($RR = 1.04, p < .01$). The number of drinking buddies and heavy drinkers in the husbands' social network was also associated with greater risk for alcohol problems (drinking buddies: $RR = 1.05, p < .01$; heavy drinkers: $RR = 1.06, p < .01$). None of the other individual, partner, or demographic predictors was significant.

Alcohol Problems among Wives—Wives' baseline alcohol problems were associated with greater risk of post marriage alcohol problems ($RR = 1.20, p < .001$; Table 5, right columns). As with the prediction of husbands' alcohol problems, wives' heavy drinking was associated with increased risk for having alcohol problems ($RR = 1.43, p < .001$). Baseline antisocial behaviors among women were also related to the number of alcohol problems ($RR = 1.52, p < .05$). Wives' alcohol scores on the SPP subscale of the AEQ were significantly associated with wives' alcohol problems ($RR = 1.27, p < .05$). Similar to the model

predicting husbands' alcohol problems, marital satisfaction was associated with a decreased risk for alcohol problems. Each one standard deviation increase in marital satisfaction was associated with a 23% reduction in the risk for alcohol problems over time (RR = 0.77, $p < .001$). There was also evidence for spousal and peer influence. Greater levels of husbands' alcohol problems increased risk for alcohol problems in wives (RR = 1.04, $p < .001$). In terms of the social network, a greater number of "drinking buddies" in the wives' social network was associated with more alcohol problems among wives (RR = 1.05, $p < .05$); however, the number of heavy drinkers in the wives' social network was not related to increased risk. European American wives, compared to non European American wives were less likely to have alcohol problems (RR = 0.72, $p < .05$). None of the other predictors was significant in the model.

Discussion

By the time young men and women marry in their late twenties, many have been drinking for a decade or more, and often have established drinking patterns and preferences. Moreover, many of the risk factors for heavy drinking and alcohol problems have had an opportunity to influence these drinking patterns at earlier stages of development. For example, a family history of alcoholism is prospectively predictive of substance use onset and escalation in early adolescence (Chassin & Barrera, 1993; Hill, Shen, Lowers, & Locke, 2000; Wong et al., 2006). Similarly, externalizing, delinquent, and antisocial behaviors are predictive of drinking in early adolescence and getting drunk and experiencing alcohol problems in later adolescence (Windle, 1990; Wong et al., 2006). Across early adulthood, Jackson and Sher (2005) found that family history of alcoholism and conduct disorder were associated with chronic trajectories of alcohol use disorders and alcohol consequences, while depression/anxiety was associated with chronic alcohol use disorders. Alcohol expectancies are related to the initiation of drinking in adolescence, escalation of use, and alcohol problems in early adulthood (Smith, Goldman, Greenbaum, & Christiansen, 1995; Stacy, Newcomb, & Bentler, 1991). At the time of marriage, these individual risk factors were strongly associated with the frequency of heavy drinking and with the occurrence of alcohol problems for both men and women with few exceptions. In fact, only men's negative affect was not associated with their baseline heavy drinking. All of the other risk factors were significantly related to drinking and alcohol problems prior to marriage.

Inasmuch as marriage, both in concert with other developmental milestones and independently, tends to initiate a normative decline in risky and antisocial behaviors, it is critical to determine the factors that are predictive of a failure to change. The results of this study demonstrate that baseline risk is an obviously important variable, but also that aspects of the post marriage social environment play an important role. For both husbands and wives, the heavy drinking of their partner and of their social network were significant predictors of their own heavy drinking. These findings contrast with our earlier findings in several important ways. First, our earlier analysis (Leonard & Mudar, 2003) that focused only on the pre-post marriage transition found no evidence that social networks characterized by drinking buddies or heavy drinkers were longitudinally predictive of drinking. In addition, in our analyses of husband and wife influence over the first three assessments (Leonard & Mudar, 2004), we found evidence for husband to wife influence

from pre-post marriage, and wife to husband influence from the 1st to 2nd anniversary. Our current analyses focus on predictions of drinking at the 1st, 2nd, and 4th anniversaries, and examine the overall effects over that time. Viewed in this way, the current findings suggest that heavy drinking after marriage is strongly influenced by the post marriage social environment. Moreover, the finding that alcohol expectancies for positive social effects of drinking were strongly predictive of post marriage drinking is consistent with this perspective.

The pattern of results with respect to post marriage alcohol problems was somewhat different. As might be expected, both baseline alcohol problems and heavy drinking at the preceding assessment were predictive of post marriage alcohol problems. Similar to post marriage heavy drinking, social environment factors, including partner's alcohol problems, social network drinking, and expectations of social effects, were predictive of post marriage alcohol problems. However, there were also a number of predictors that were unique to the prediction of post marriage alcohol problems. For both men and women, higher levels of marital satisfaction served as a protection against post marital alcohol problems. This may reflect, in part, the fact that a number of the alcohol problems referred specifically to problems with one's partner that resulted from drinking. However, it is also plausible that problems not specific to the marriage, which in fact were more common than the marital problems, might be mitigated by one's feelings of marital satisfaction, perhaps by drinking in less risky ways or less risky contexts. These findings are also consistent with clinical studies indicating that positive outcomes after alcoholism treatment are fostered by marital satisfaction (Maisto et al., 1998; Orford, et al., 1975) and that alcoholism treatment is more effective when treatments focused on improving marital functioning are also provided (e.g. O'Farrell, Cutter, & Floyd, 1985; McCrady, et al., 1986). In addition, these findings are also consistent with a broader literature suggesting that marital quality is associated with desistence from antisocial behavior and substance use (Laub, Nagin, & Sampson, 1998; Maume, Ousey, & Beaver, 2005). It is noteworthy that Maume et al. (2005) found that both marital quality and reductions in delinquent peer contact predicted desistence from marijuana, a finding that is very consistent with our analysis of alcohol problems, although not heavy drinking, per se.

In addition to marital satisfaction, there were several other predictors of post marriage alcohol problems. For men, high levels of negative affect were predictive of problems, while for women, high levels of antisocial behavior were predictive of problems. This pattern of findings is somewhat counter-intuitive inasmuch as antisociality is usually associated with male alcoholism and negative affect is usually associated with female alcoholism. However, it is important to note that both antisociality and negative affect were bivariate associated with baseline alcohol problems, and that this was the case for both men and women. In addition, the intercorrelations among the predictor variables suggest that antisociality was more strongly linked to other predictors than was negative affect for men, while the reverse was the case for women. For men, the expectancy that alcohol increased power and aggression was also predictive of alcohol problems. There are several potential explanations for this finding. It is possible that this expectancy was linked specifically to aggressive problems, both within the marriage as well as with friends, family, and others. For example, Barnwell, Borders, and Earleywine (2006) found that alcohol expectancy for aggression was

cross-sectionally associated with aggressive behaviors among heavy drinkers. However, it should be noted that to date, the available evidence does not support a longitudinal association between expectancies and aggression (Quigley & Leonard, 1999). Alternatively, the power and aggression expectancy is correlated with other measures of hostility and anger, and it is plausible that these characteristics, over and above antisociality, are predictive of behavioral problems after drinking (Giancola, Godlaski, & Parrott, 2005). Further research is needed to examine these possibilities.

There are several limitations that should be noted in interpreting the present study. Although the participation rate at baseline was comparable to or exceeded other recent studies of newlywed couples (e.g., Rusbult, Bissonnette, Arriaga, & Cox, 1998; Veroff, Douvan, Orbuch, & Acitelli, 1998), a significant proportion of recruited couples did not return their questionnaires and there were some differences between couples who completed the initial assessment and those who did not. Over the four waves of data collection, we maintained 81% of wives, and 71% of husbands. Although there were minimal differences between those who completed the four waves and those who did not on the variables that we assessed, it is possible that completers and dropouts differed on other constructs. A second limitation is that we did not collect information regarding the diagnostic status of the participants. Given the general population nature of the sample, and the self report questionnaire assessment, we chose to focus on continuous measures of alcohol problems instead. A third limitation is that the assessment of the drinking of their peers was based on husband and wife reports. While there is no reason to suspect that this influenced the results, it is important to recognize that we assessed their perception of the drinking of their peers, and that we did not directly assess the peers. Finally, the study focuses on newly married couples in their first marriages. Different factors may relate to drinking and drinking problems after longer duration of marriage.

Notwithstanding these limitations, the results of the present study provide important insights into heavy drinking and alcohol problems among recently married couples. The results demonstrate that while many of the traditional risk factors for alcoholism are related to heavy drinking and alcohol problems at the time of marriage, the most influential factors after marriage reflect the influence of the current social environment, specifically the drinking of one's partner and of one's peers. In addition, the quality of the marriage appears to provide some protection from the experience of alcohol problems, although it does not exert an impact on heavy drinking. These findings are consistent with treatment studies that indicate the value of actively incorporating significant others into treatment, and suggest that prevention and early intervention activities could benefit from a focus on the social interpersonal environment of young adults.

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Table 1

Descriptive Statistics

	Husband variables				Wife variables			
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 1	Wave 2	Wave 3	Wave 4
Frequency of heavy drinking (%)								
Weekly or more freq. of intox.	15.0%	13.0%	11.4%	10.2%	5.4%	4.5%	4.6%	4.3%
1+ times per month freq. of intox.	19.7%	20.2%	18.9%	17.5%	11.7%	8.9%	7.4%	6.7%
1+ times per year freq. of intox.	35.0%	33.0%	35.1%	35.4%	41.6%	37.6%	36.6%	35.6%
None in the past year	30.3%	33.8%	34.7%	36.9%	41.3%	49.0%	51.3%	53.4%
Alcohol problems, mean (SD) ^f	3.61 (6.64)	3.65 (7.57)	2.99 (6.18)	2.47 (5.13)	1.49 (3.23)	1.57 (4.26)	1.13 (3.09)	1.25 (3.58)

^f Range for alcohol problems 0-35

Table 2

Correlations among Predictors at Baseline

	1	2	3	4	5	6	7	8	9
1. MAT		-.17**	-.31**	-.08*	-.19**	-.04	-.18**	-.05	-.10
2. ABC			.30**	.26**	.17**	.06	.28**	.15**	.16**
3. Negative affect				.12**	.21**	.12**	.28**	.04	.13**
4. Positive family hx.					.06	.01	.07	.09*	.23**
5. AEQ-GP						.47**	.52**	.14**	.09*
6. AEQ-SPP							.40**	.30**	.20**
7. AEQ PA								.22**	.20**
8. Number of drinking buddies								.13**	.33**
9. Number of heavy drinkers								.10**	.34**

Note: Husbands' correlations are below the diagonal and wives are above the diagonal.

MAT: Marital Adjustment Test; ABC: Antisocial Behavior Checklist; Positive family hx: Positive family history of alcoholism; AEQ-GP: Global Positive-Alcohol Expectancy Questionnaire; AEQ-SPP: Social/Physical Pleasure-Alcohol Expectancy Questionnaire; AEQ-PA: Power and Aggression-Alcohol Expectancy Questionnaire.

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 3

Correlations between predictor variables and outcome variables at baseline

	Husband heavy drinking	Husband alcohol problems	Wife heavy drinking	Wife alcohol problems
H MAT	-.10*	-.28**	-.02	-.11**
H ABC	.23**	.32**	.13**	.14**
H negative affect	.06	.14**	.02	.09*
H positive family hx	.12**	.17**	.076	.12**
H AEQ-GP	.36**	.34**	.16**	.16**
H AEQ-SPP	.46**	.34**	.22**	.13**
H AEQ-PA	.24**	.34**	.08*	.16**
H number of drinking buddies	.35**	.20**	.22**	.07
H number of heavy drinkers	.19**	.18**	.11**	.04
W MAT	-.09*	-.19**	-.11**	-.16**
W ABC	.08*	.08*	.28**	.31**
W negative affect	.05	.07	.09*	.21**
W positive family hx	.10**	.12**	.16**	.11**
W AEQ-GP	.10*	.08*	.17**	.25**
W AEQ-SPP	.22**	.08*	.33**	.26**
W AEQ-PA	.16**	.11**	.24**	.40**
W number of drinking buddies	.24**	.18**	.32**	.30**
W number of heavy drinkers	.16**	.12**	.21**	.22**

Note:

MAT: Marital Adjustment Test; ABC; Antisocial Behavior Checklist; Positive family hx: Positive family history of alcoholism; AEQ-GP: Global Positive-Alcohol Expectancy Questionnaire; AEQ-SPP: Social/Physical Pleasure-Alcohol Expectancy Questionnaire; AEQ-PA: Power and Aggression-Alcohol Expectancy Questionnaire.

** Correlation is significant at the 0.01 level 2-tailed

* Correlation is significant at the 0.05 level 2-tailed

Table 4

Prospective Prediction of Husband Heavy Drinking and Alcohol Problems

Variable	Husband heavy drinking				Husband alcohol problems			
	Risk ratio	Robust SE	95% CI		Risk ratio	Robust SE	95% CI	
Husband Predictors								
<i>MAT</i>	0.97	0.02	0.94	1.01	0.87**	0.05	0.79	0.97
ABC	1.08 ⁺	0.04	0.99	1.16	1.19	0.19	0.87	1.63
<i>Negative affect</i>	1.00	0.01	0.97	1.03	1.13 ⁺	0.08	0.99	1.29
Wave 1 heavy drinking	1.22***	0.01	1.20	1.24				
Positive family hx.	0.99	0.03	0.94	1.05	1.04	0.11	0.85	1.28
<i>AEQ-GP</i>	1.02	0.02	0.98	1.06	0.91	0.09	0.75	1.10
<i>AEQ-SPP</i>	1.12***	0.02	1.09	1.15	1.29***	0.09	1.13	1.48
<i>AEQ-PA</i>	0.99	0.02	0.96	1.02	1.33***	0.09	1.16	1.53
Wave 1 Alc. problems					1.09***	0.01	1.08	1.11
<i>Heavy drinking</i>					1.37***	0.05	1.27	1.48
Wife Predictors								
<i>MAT</i>	0.97	0.02	0.94	1.01	0.98	0.06	0.86	1.12
ABC	1.10	0.07	0.97	1.26	1.11	0.20	0.78	1.58
<i>Negative affect</i>	0.99	0.02	0.96	1.02	0.95	0.07	0.83	1.08
<i>Heavy drinking</i>	1.06***	0.01	1.04	1.08	0.95	0.04	0.88	1.02
Positive family hx.	1.02	0.03	0.97	1.08	1.16	0.12	0.94	1.43
<i>AEQ-GP</i>	1.00	0.02	0.96	1.03	0.96	0.07	0.83	1.12
<i>AEQ-SPP</i>	0.99	0.01	0.96	1.02	1.08	0.07	0.95	1.21
<i>AEQ-PA</i>	0.99	0.01	0.96	1.02	1.01	0.07	0.88	1.15
<i>Alcohol problems</i>					1.04***	0.01	1.02	1.07
Social Network								
<i>H drinking buddies</i>	1.02***	0.01	1.01	1.03	1.05**	0.02	1.01	1.08
<i>W drinking buddies</i>	1.00	0.01	0.99	1.01	0.99	0.02	0.96	1.03
<i>H heavy drinkers</i>	1.01	0.01	1.00	1.02	1.06**	0.02	1.02	1.11
<i>W heavy drinkers</i>	0.99	0.01	0.98	1.01	0.97	0.03	0.92	1.03
Husband Covariates								
Age	1.00	0.00	1.00	1.00	1.01	0.01	0.99	1.03
Parent prior to marriage	0.98	0.03	0.92	1.04	1.02	0.13	0.79	1.31
<i>Past year pregnancy</i>	0.98	0.03	0.93	1.03	0.87	0.10	0.70	1.09
Months of cohabitation	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.01
Education	1.01	0.03	0.96	1.06	1.02	0.12	0.82	1.28
Race/ethnicity	1.00	0.03	0.94	1.06	1.05	0.12	0.84	1.31
Employment	0.97*	0.02	0.93	0.99	0.99	0.07	0.87	1.14

Notes:

MAT: Marital Adjustment Test; ABC: Antisocial Behavior Checklist; Positive family hx: Positive family history of alcoholism; AEQ-GP: Global Positive-Alcohol Expectancy Questionnaire; AEQ-SPP: Social/Physical Pleasure-Alcohol Expectancy Questionnaire; AEQ-PA: Power and Aggression-Alcohol Expectancy Questionnaire. Italicized variables were modeled as time varying predictors; variables in normal font were modeled as time invariant predictors.

+
p .08

*
p < .05

**
p < .01

p < .001

Table 5

Prospective Prediction of Wife Heavy Drinking and Alcohol Problems

Variable	Wife Heavy Drinking			Wife Alcohol Problems			95% CI	95% CI
	Risk Ratio	Robust SE	95% CI	Risk Ratio	Robust SE	95% CI		
Wife Predictors								
<i>MAT</i>	0.97 [*]	0.01	0.94	0.99	0.77 ^{***}	0.05	0.67	0.88
ABC	1.19 ^{**}	0.06	1.07	1.32	1.52 [*]	0.30	1.04	2.24
<i>Negative affect</i>	1.01	0.01	0.98	1.04	0.98	0.11	0.78	1.24
Wave 1 heavy drinking	1.25 ^{***}	0.01	1.22	1.28				
Positive family hx.	1.00	0.03	0.95	1.05	1.13	0.17	0.84	1.53
<i>AEQ-GP</i>	1.05 [*]	0.02	1.01	1.10	1.03	0.12	0.82	1.28
<i>AEQ-SPP</i>	1.08 ^{***}	0.01	1.06	1.11	1.27 [*]	0.12	1.05	1.53
<i>AEQ-PA</i>	0.97	0.02	0.95	1.01	1.10	0.11	0.91	1.33
Wave 1 alc. problems					1.20 ^{***}	0.02	1.16	1.24
<i>Heavy drinking</i>					1.43 ^{***}	0.07	1.30	1.56
Husband Predictors								
<i>MAT</i>	1.02	0.01	0.99	1.04	1.01	0.07	0.88	1.16
ABC	0.98	0.04	0.91	1.06	0.73	0.17	0.46	1.15
<i>Negative affect</i>	0.99	0.01	0.97	1.02	0.97	0.10	0.79	1.20
<i>Heavy drinking</i>	1.05 ^{***}	0.01	1.03	1.06	1.00	0.04	0.92	1.08
Positive family hx.	1.04	0.03	0.99	1.10	0.89	0.15	0.64	1.25
<i>AEQ-GP</i>	0.99	0.02	0.96	1.02	1.02	0.09	0.86	1.23
<i>AEQ-SPP</i>	0.98	0.01	0.96	1.01	0.98	0.09	0.83	1.17
<i>AEQ-PA</i>	1.01	0.01	0.99	1.04	1.13	0.09	0.96	1.33
<i>Alcohol problems</i>					1.04 ^{***}	0.01	1.02	1.06
Social Network								
<i>H drinking buddies</i>	0.99	0.00	0.99	1.00	0.98	0.02	0.94	1.02
<i>W drinking buddies</i>	1.03 ^{***}	0.01	1.02	1.04	1.05 [*]	0.02	1.01	1.09
<i>H heavy drinkers</i>	1.00	0.01	0.99	1.01	1.00	0.04	0.93	1.07
<i>W heavy drinkers</i>	1.02 ^{**}	0.01	1.01	1.03	1.02	0.04	0.96	1.09
Wife Covariates								
Age	1.00	0.00	1.00	1.01	1.01	0.02	0.97	1.04
Parent prior to marriage	1.00	0.03	0.95	1.05	1.10	0.18	0.80	1.51
<i>Past year pregnancy</i>	0.93 ^{**}	0.02	0.89	0.97	0.81	0.14	0.57	1.14
Months of cohabitation	1.00	0.00	1.00	1.00	1.00	0.00	0.99	1.01
Education	0.99	0.03	0.94	1.04	0.91	0.16	0.64	1.29
Race/ethnicity	1.03	0.03	0.98	1.08	0.72 [*]	0.10	0.55	0.94
Employment	1.00	0.01	0.97	1.03	1.02	0.10	0.84	1.24

Notes:

MAT: Marital Adjustment Test; ABC: Antisocial Behavior Checklist; Positive family hx: Positive family history of alcoholism; AEQ-GP: Global Positive-Alcohol Expectancy Questionnaire; AEQ-SPP: Social/Physical Pleasure-Alcohol Expectancy Questionnaire; AEQ-PA: Power and Aggression-Alcohol Expectancy Questionnaire. Italicized variables were modeled as time varying predictors; variables in normal font were modeled as time invariant predictors.

*
p < .05

**
p < .01

p < .001