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Marriage, Divorce, and Alcohol Use in Young Adulthood: A Longitudinal Sibling-Comparison Study

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Abstract

Marital status is a robust predictor of alcohol consumption in young adulthood; however, the extent to which observed associations are due to socialization or selection processes is unclear. The current study examined associations between marital status and alcohol use, assessed in a sample of 5,150 young adults (ages 18–30) from the National Longitudinal Survey of Youth. A longitudinal sibling-comparison design controlled for family-level environmental and genetic selection factors and for an individual's premarital trajectory of alcohol use. Nested model comparisons tested whether gender and age moderated the effects of marriage and divorce. Controlling for selection factors, the transition into marriage predicted decreases in alcohol consumption, and this effect was consistent across gender and age. Divorce predicted increased consumption, particularly for men. Findings support a causal relationship between changes in marital status and alcohol use, rather than an association due to selection factors and suggest gender-specific changes in alcohol use following divorce.

Keywords

marriage, alcohol use, sibling comparisons

On average, young adults sharply increase their alcohol use during the initial transition to adulthood (ages 18–22) and then "mature out" of heavy alcohol use through their 20s and early 30s (Bachman et al., 2002; Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). Against the backdrop of these normative developmental patterns, however, are marked individual differences in trajectories of substance use during young adulthood (Curran, Muthén, & Harford, 1998; Zucker, Fitzgerald, & Moses, 1995). Not all young adults mature out of heavy alcohol use, and those who continue to drink heavily are more likely to continue engaging in a number of behavioral risks with serious health consequences (such as unprotected sexual intercourse, driving after drinking, and illicit drug use; Flowers et al., 2008; Kiene, Barta, Tennen, & Armeli, 2009; Richardson & Budd, 2003). Failure to reduce heavy alcohol use is also associated with increased risk for developing an alcohol use disorder (Guo, Collins, Hill, & Hawkins, 2000; Schulenberg, Maggs, & O'Malley, 2003) and for multiple chronic medical and psychiatric problems (Centers for Disease Control and Prevention, 2004; Wang & Patten, 2002). Understanding both the mechanisms and the moderators of normative developmental declines in alcohol use has been a research topic of considerable interest.

The Marriage Effect

Maturing out of alcohol use has been attributed to the adoption of new adult social roles, such as marriage, parenthood, and employment, which impose new environmental constraints and expectations. Several longitudinal studies have shown that marriage, in particular, is a robust predictor of declining alcohol consumption during young adulthood, suggesting that marriage serves as protective factor against heavy alcohol use and alcohol use disorders (Bachman, Wadsworth, O'Malley, & Schulenberg, 1997; Curran et al., 1998; Harford, Hanna, & Fadden, 1994; Miller-Tutzauer, Leonard, & Windle, 1991; Temple et al., 1991). Several mechanisms for this association have been proposed, including changes in recreational and social activities, changes in attitudes toward drinking, and onset of parenthood (Bachman et al., 2002). More generally, marriage represents a strong social commitment not only to one's partner but also to conventional values and mainstream society, which has been shown to alter trajectories of antisocial and deviant behavior including drinking and drug use (Sampson & Laub, 1990).

In contrast, a parallel line of research indicates that the health benefits of marriage are generally undermined or reversed by divorce. Epidemiological studies have consistently shown higher rates of drinking among individuals who have

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divorced, and longitudinal studies suggest a prospective relationship between dissolution of relationships and increased alcohol use (Bachman, et al., 1997; Hanna, Faden, & Harford, 1993; Power & Estaugh, 1990; Temple et al., 1991). Increased alcohol use following divorce may result from both the loss of the protective effects of marriage and the additional burden of emotional, interpersonal, familial, and financial stress that divorce often incurs.

Moderators of the Marriage Effect

Despite the robust association between marital status and alcohol consumption, these effects are not universal, and research on moderating factors has produced inconsistent findings. Numerous studies have proposed gender differences in the impact of marriage on alcohol use (Bernard, 1972; Nock, 1998), and several have shown that marriage leads to stronger declines in alcohol use among men (Harford et al., 1994; Power & Estaugh, 1990; Reczek, Pudrovska, Carr, & Umberson, 2012; Waite & Gallagher, 2000). There are several reasons why changes in marital status may be more closely related to alcohol use in men than in women. The ''behavior contagion'' theory (Rhule-Louie & MacMahon, 2007) suggests that partners become more similar to each other over the course of a relationship across a range of behaviors, including substance use. Thus men, who consume more alcohol on average, will be more likely to reduce alcohol use to a level more consistent with their female partners. A recent mixed-methods longitudinal study (Reczek et al., 2012) found that marriage led men to drink less but led women to drink more, and qualitative interviews revealed that this was due to women's increased exposure to higher levels of alcohol use by their male partners. However, these findings are inconsistent with some previous studies that have found a stronger effect in women (Horwitz, White, & Howell-White, 1996) and other studies have found no moderation by gender (Bachman et al., 2002; Curran et al., 1998; Temple et al., 1991). Thus, there is theoretical support for a stronger marriage effect in men, but empirical evidence for gender moderation remains inconclusive.

The impact of marital transitions on alcohol use may also depend on the developmental stage at which these transitions occur, as sources of social influence vary throughout the lifespan (Umberson, Crosnoe, & Rezcek, 2010). Marriage may be more protective in early adulthood because it may attenuate the effect of peers on alcohol use, which remains strong at this time (Borsari & Carey, 2001). Given that a primary mediator of the marriage effect is fewer evenings out with peers (Bachman et al., 2002), and that young adults in the early-to-mid 20s drink more, on average, than older adults, factors that reduce exposure to peer alcohol use may be particularly influential during this stage in life. Moreover, compared to individuals in their 30s, emerging adults are less likely to have achieved other major social milestones, such as full-time employment or parenthood. Consequently, the effect of any one transition, such as becoming married, may be more apparent among young adults. In addition, the effect of marriage on health behavior in general may remain consistent over time, but the targets of influence may change depending on the developmental context (Umberson et al., 2010). In the early 20s, when the mean population level of alcohol use peaks, social transitions may affect this behavior specifically. In contrast, in later years, marriage may impact other more salient aspects of health, such as nutrition or physical activity (e.g., Smith & Christakis, 2008).

On the other hand, individual differences in marital status during early adulthood, when marriage is the exception rather than the norm, may be more reflective of underlying individual differences. For example, very early marriage may be a marker for deviance, as it has been associated with antisocial behavior and alcohol and drug use (Jessor & Jessor, 1977; Martino, Collins, & Ellickson, 2004). Individuals who marry in their late teens or early 20s may be less likely to reduce drinking due to an underlying tendency to reject conventional norms. Precocious development theory (Newcomb & Bentler, 1988) suggests that individuals who marry prematurely may lack the psychosocial resources necessary to sustain healthy relationships. This is consistent with research showing higher rates of marital distress and divorce among individuals who marry in late adolescence, which may undermine the health benefits of marriage (Amato & Rogers, 1997; Booth & Edwards, 1985).

One previous longitudinal study tested whether the marriage effect was moderated by age. Bogart, Collins, Ellickson, Martino, and Klein (2005) compared the effects of marriage in adolescence (prior to age 20) and young adulthood (between 21 and 29) among women. Women who married in young adulthood drank less and experienced fewer alcohol-related consequences at age 29, regardless of whether they divorced. These same protective effects were also observed in women who married in adolescence, but only if they did not subsequently divorce. These results suggest that early marriage and subsequent divorce may reflect an underlying disposition toward non-normative behavior, impulsivity, and externalizing problems, all of which are associated with higher levels of alcohol use (Martino et al., 2004). In contrast, individuals who marry early and stay married may represent a unique group with lower propensity for heavy alcohol use.

Socialization and Selection

The possibility that the apparent marriage ''effect'' on drinking actually reflects individual differences that preexisted the entry into marriage illustrates the distinction between ''role socialization'' and ''role selection'' (Chassin, Presson, Sherman, & Edwards, 1992; Gotham, Sher, & Wood, 1997; Yamaguchi & Kandel, 1985). The role socialization process occurs when a new social role (such as marriage) requires declines in behaviors that are incompatible with that role (such as heavy drinking). This process represents a causal association between marriage and alcohol use. The role selection process refers to individual differences that influence young adults' ability to complete developmental tasks, such as marriage. Individuals who drink heavily may be less able to maintain stable relationships than those who do not; this may be due to alcohol use

itself or to other individual differences (e.g., socioeconomic status, religion, regional residency, and genetic factors) that influence both alcohol use and likelihood of marriage. In standard epidemiological designs, one can control for specific potential selection factors by including them as statistical covariates. Studies of marital status and alcohol use have found strong support for role socialization, controlling for a range of potential selection effects (e.g., Bachman et al., 2002; Gotham, Sher, & Wood, 2003), including premarital levels of alcohol use. However, with this approach, one is limited to the specific factors that can be identified and measured, leaving many other potential selection effects untested.

Sibling-Comparison Designs

The sibling-comparison design (Lahey & D'Onofrio, 2010) provides a useful method for disentangling selection and socialization. This quasi-experimental design uses comparisons within sibling pairs to control for genetic and environmental factors shared by siblings raised in the same family. This approach tests whether siblings who are discordant for a hypothesized predictor variable (i.e., marital status) are also discordant for a developmental outcome (i.e., alcohol use trajectory). The marital status of one's sibling is used as a proxy for family-level genetic and environmental factors that are correlated with marital status. In other words, the marital status of one's siblings reflects whether one comes from the "type" of family that tends to get married and/or divorced. If the association between marital status and alcohol use patterns is due to unmeasured background factors that siblings share, then one would expect that all siblings who share these background factors to show similar trajectories of alcohol use. This type of association can be considered a "between-family" effect. Families who, on average, tend to marry in early adulthood would also tend to reduce alcohol use at this time, not because marriage causes reductions in drinking but because both marriage and drinking are influenced by family-level factors. On the other hand, if siblings who become discordant for marital status become discordant for alcohol use at this age (i.e., one sibling marries and the other remains single), this provides strong evidence that the change in marital status influenced drinking at the individual level. The extent to which siblings who differ in marital status also differ in alcohol use can be considered a "within-family effect" of marriage. The sibling-comparison design allows one to distinguish between-family and within-family differences.

Several previous studies have utilized this design as a powerful test of a causal relationship between marital transitions and alcohol use, as well as other psychosocial outcomes. Heath, Jardine, and Martin (1989) analyzed data from a sample of female Australian twins (aged, on average, 35 years). This study used the marital status of the co-twin as a control and found that twins who differed in marital status also differed in their alcohol consumption—married twins drank less than their single co-twins. There was no correlation between one's own alcohol consumption and the marital status of one's co-twin. These findings suggest that the association between marital status and alcohol use is not solely an artifact of being raised in the "type" of family that tends to get married and drink less; if it were, one would expect that both twins raised in this type of family would have similarly low levels of alcohol use, regardless of their own marital status. A more recent study of White female twins, aged 17–61 (Prescott & Kendler, 2001), found similar results. The effect of marriage on alcohol consumption persisted after controlling for the marital status of one's co-twin. However, consumption patterns were associated with the divorce of one's co-twin, suggesting that for women, family-level background factors might account, at least in part, for the apparent effect of divorce on drinking. Notably, both these studies were specific to women. The lack of previous family-based research on the marriage effect in males is striking, given the gender differences proposed by previous authors (e.g., Reczek et al., 2012). It is plausible that the relative roles of selection and socialization differ by gender, and this has yet to be tested using a quasi-experimental approach.

The current study used a sibling-comparison design to test whether the association between marital status and reduced alcohol use persisted after controlling for between-family genetic and environmental background factors. Multiple-group model comparisons tested whether age and gender moderated the effects of marriage and divorce on alcohol use. Latent growth curve modeling (LGM) was used to examine the association between marriage, divorce, and trajectories of alcohol consumption between ages 18 and 30 in a large, nationally representative sample of males and females from the National Longitudinal Survey of Youth (NLSY).

Method

Participants

Data were drawn from the 1979 cohort of the NLSY (NLSY79), a study of young people's transition into the workforce, initiated by the U.S. Department of Labor. The NLSY used a stratified, clustered design to select a nationally representative sample of adolescents and young adults, aged 14–21 at the time of the initial assessment. The initial assessment in 1979 had a 90% response rate and included 12,686 participants. As the NLSY recruited multiple individuals within households, the initial 1979 cohort included 5,914 siblings (biological, step, and adopted). During the interview, a household roster was completed by the participant or his/her parent (if the participant was under 18 years old). This roster asked about members of the household and their relationship to the participant (i.e., spouse, sibling, half-sibling, and nonbiologically related relative). Participants were reinterviewed annually between 1980 and 1994, and biennially thereafter. Retention was >90% for the first 16 waves and has been >80% since then. Details about recruitment and interview procedures have been extensively described elsewhere (U.S. Bureau of Labor Statistics, 2005).

The current study used a subsample of 5,150 full biological siblings, nested within 2,239 households. The subsample was constructed according to several criteria. Because developmental

Table 1. Demographic Characteristics of Full NLSY Sample and Sibling Subsample.

	Total NLSY Sample ($N = 12{,}686$)	Sibling Subsample ($N = 5{,}150$)
Mean (*SD*) age at baseline	17.90 (2.31)	17.27 (2.09)
Male	50%	54%*
White	59%	53%*
African American	25%	31%*
Hispanic	16%	16%
Mean (*SD*) alcohol consumption (drinks/month)	15.98 (22.28)	15.88 (20.43)

Note. NLSY = National Longitudinal Survey of Youth.
*$p < .05$, significantly different from total sample.

period of interest was ages 18–30, participants who were already married at or before age 18 ($N = 590$, 4.6% of total sample) were excluded, as well as participants who were widowed or remarried between ages 18 and 30 ($N = 993$, 7% of total sample).[1] In addition, participants were excluded if no data on marital status were available between 19 and 30 ($N = 54$, <1% of total sample). The subsample in the current study included full siblings (and excluded adopted siblings, step-siblings, and half-siblings), identified from the household roster. Fifty-five percent of the participants in the current study sample had one sibling only, 31% had two siblings, 11% had three siblings, and 3% had four or more siblings in the study. Both same-sex and opposite-sex siblings were included.[2] As shown in Table 1, the participants in the subsample were more likely to be African American and male and less likely to be White than the full NLSY sample.

Not every participant provided data at each age between 18 and 30. This incompleteness is primarily due to the NLSY design: (1) Participants who were older than 18 at study initiation did not have the opportunity to report on their alcohol use at every age between 18 and 30; (2) younger cohorts were assessed biennially instead of annually; and (3) alcohol use items were not included in the interviews every year. Because alcohol use items were not included in all the interviews, there were gaps, ranging from 1 to 3 years, between marital transitions and alcohol use assessments. Participants who were older than 18 and married at study initiation were included in the analysis. Our analytic procedure was designed to make use of all available data on marriage and alcohol use, with full information maximum likelihood (FIML) used to account for missingness (Schafer & Graham, 2002). The average number of times alcohol consumption was assessed for a participant was 4.4 (range 0–6). Participants with no data on alcohol consumption were retained because they provided information on within- and between-family differences in marital status.

Measures

Demographics. Demographic variables included gender (0 = *female*), race (0 = *not African American*; 1 = *African American*) and ethnicity (0 = *not Hispanic/Latino*, 1 = *Hispanic/Latino*). Although race and ethnicity were not a focus of the current analyses, they were included as predictors based on well-established evidence for higher levels of alcohol consumption in Caucasians relative to both African American and Hispanic/Latino individuals (O'Malley & Johnston, 2002; National Institute of Alcohol Abuse and Alcoholism, 2006).

Alcohol Consumption. Questions about alcohol consumption were added to the NLSY survey in 1982. The observation period in the current analysis included interviews from 1982 to 1995, which was the period during which participants were in the 18–30 age range. Alcohol consumption was assessed in 1982, 1983, 1984, 1985, 1988, 1989, 1992, and 1994. Participants were asked how many days they consumed alcohol in the past month and how many drinks they consumed on a typical day when they were drinking in the past month. These values were multiplied to obtain an estimate of number of drinks consumed in the last month.

Change in Marital Status. Participants were asked about marital status at each wave, and reported whether they were married, single, divorced, remarried, widowed, or separated. If marital status had changed since the previous assessment, they were asked when this change occurred. The current study derived four dichotomous measures of marital status. Getting married since the previous assessment was coded as 1; not getting married since the previous assessment was coded as 0. Getting divorced was coded in the same way. One limitation of this measurement approach is that we could not account for multiple transitions that occurred between assessments; rather, change in marital status was based on status at the time of the assessment compared to status at the time of the previous assessment. For example, individuals who were married and divorced between two assessments were classified as divorced.

Two additional dichotomous variables indicated whether any of the siblings in a family (full siblings from the same 1979 household) had married or divorced in the previous year (1 = *yes*, 0 = *no*).

Analytic Plan

Data were analyzed in several steps. In an initial descriptive analysis, we examined age differences in alcohol use. We used group means comparisons to explore differences in alcohol consumption as a function of marital status. At each age, mean alcohol consumption was estimated separately for individuals who were married, divorced, and single at that time. Next, we used latent growth modeling to examine within-person trajectories of alcohol use between ages 18 and 30. We followed methods used by Curran, Muthén, and Harford (1998) in their analysis of the same data set and included time-specific changes in marital status as predictors of alcohol use trajectories. We use sibling marital status as a proxy variable for unmeasured, family-level background factors that may influence both marriage and drinking. Finally, we used a series of model comparisons to test for moderation by gender and by age at marriage. Differences in model fit were tested using

differences in model log likelihood. All analyses used FIML estimates to account for missing data. Model fit was assessed using the standardized root mean square residual (SRMR), with SRMR values of less than .08 indicating close fit to the data (Hu & Bentler, 1999).

Results

Mean Differences in Drinking by Marital Status

Mean levels of alcohol consumption by age, stratified by marital status, are illustrated in Figure 1. Because these analyses were intended to be purely descriptive, and because we account for the role of sampling error in our subsequent structural equation models, no inferential statistics were calculated here. Mean alcohol consumption increased from ages 18 to 21 and remained relatively stable until declining at age 30; this pattern suggested a nonlinear trend in alcohol use over emerging adulthood, which is consistent with previous research (Bachman et al., 2002; SAMHSA, 2011). Variability (reflected in standard deviations [*SD*s]) in alcohol consumption increased between ages 18 and 30.

These group mean differences do not reflect within-person changes in consumption; rather, each point shows the mean level of alcohol consumption for individuals who were assessed at each age. As indicated in Figure 1, there were no divorced women assessed at ages 18–19 and no divorced men assessed at ages 18–20. The high variability in consumption for the divorced group, particularly before age 24, reflects the relatively small number of individuals who were divorced at that time.

Married men show a stable level of alcohol use that is consistently lower than that of single or divorced individuals, although significant differences between married and single men are not apparent before age 22. Married women show a stable level of consumption that is lower than unmarried women of the same age; this is consistent across all ages. Although the low number of divorced individuals makes it difficult to interpret these group mean differences, it is noteworthy that mean levels of consumption among divorced men are consistently higher than those of single or married men, a pattern that is not seen in women.

Latent Growth Curve Models

Following Curran et al. (1998), the current study used LGM to examine individual differences in trajectories of alcohol consumption between ages 18 and 30, using the software program M*plus* (Muthén & Muthén, 1998–2007).This approach models the mean developmental changes in alcohol use over time by fitting an overall curve to the data, and it also models the extent to which individual trajectories differ from this overall curve (McArdle & Nesselroade, 2002). Change in alcohol use is characterized by a latent intercept factor, which represents the starting point in an individual's trajectory of alcohol consumption, and latent slope factors, which represent systematic developmental change in alcohol consumption. Because the mean age trends in alcohol consumption suggested that early adult increases in alcohol consumption "taper off" in the mid-20s, we included in our model both a linear slope factor and a quadratic slope factor. The model can be represented algebraically as:

$$Y[t]_n = y_{\mathrm{Ln}} + A[t] \times y_{\mathrm{Sn}} + B[t] \times y_{\mathrm{Qn}} + e[t]_n.$$

where y_{Ln} is latent intercept score for individual n, y_{Sn} is the latent change score representing the magnitude of linear change over time, and y_{Qn} is the latent change score representing the magnitude of quadratic change (or curvature). $A[t]$ and $B[t]$ are vectors of time-specific "basis" coefficients that represent the shape of change over time (constrained to equal [0,1,2,3, . . .] for the linear slope and to equal [0,1,4,9, . . .] for the quadratic slope), and $e[t]_n$ is a vector of time-specific residual errors. In all models, we accounted for the effects of demographics by regressing the latent intercept and change factors onto exogenous covariates (gender, race, and ethnicity). These demographic variables were not a focus of the current analyses, but they were included based on evidence that alcohol use differs across gender, race, and ethnicity (O'Malley & Johnston, 2002). The clustered nature of the data (siblings within nuclear families) was accounted for using robust standard errors (CLUSTER option in Mplus).

The growth parameters for the best-fitting model are shown in the upper portion of Table 2. For men, the means of the latent intercept and linear slope factors were nonzero positive, while the mean of the quadratic slope factor was negative, consistent with a curvilinear trajectory of alcohol consumption between ages 18 and 30. Moreover, there was significant variance in the intercept and slope factors, reflecting a high degree of individual variability in trajectories of alcohol use from 18 to 30. For women, the means of the linear and quadratic slope factors were not significant, indicating a relatively stable level of drinking over time. There was no significant variance in the intercept factor for women, but there was significant variance in the linear and quadratic slope factors, suggesting that there was greater unexplained variability in individual trajectories of alcohol consumption than in initial values of alcohol consumption. With regard to the effects of race and ethnicity on alcohol consumption, for both men and women, Black and Hispanic participants reported lower intercept scores than White and non-Hispanic participants, respectively. In addition, Black women showed greater linear slope scores than White women. Hispanic men showed greater quadratic slope scores than non-Hispanic men.

Effects of Marriage and Divorce

In the current analysis, in order to test for the effects of marriage and divorce on alcohol use, the latent growth curve model also included 12 additional latent intercept factors representing age-specific deflections in an individual's overall trajectory of alcohol consumption that resulted from changes in marital status between each time interval. The parameters of primary interest in the current study were the paths between the marital status variables and the latent intercept factors at each age.

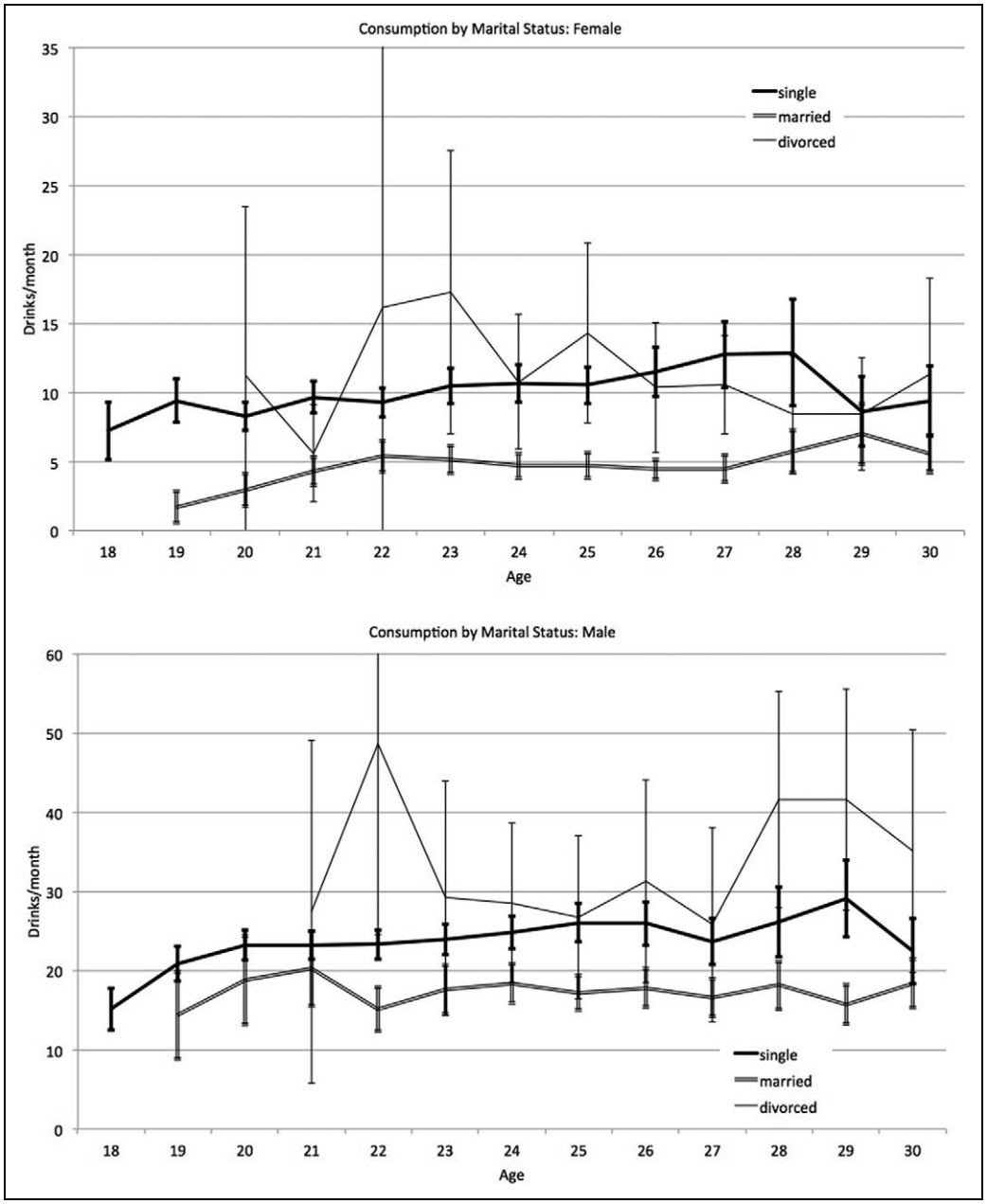

Figure 1. Mean alcohol consumption at ages 18 through 30, by marital status at each age. Error bars represent 95% confidence intervals.

These paths represent between- and within-family effects of marriage and divorce on alcohol consumption. These intercept factors were regressed onto the measured marital status variables (coded as 0 or 1, depending on whether a marital transition occurred at each age). These intercept factors predicted alcohol use at their respective ages and at each subsequent age (e.g., the age 21–22 intercept factor predicted alcohol use at ages 21–30). This design is based on the hypothesis that a discrete event—a change in marital status—would alter not only the level of consumption at the time of the event but also the overall alcohol use trajectory. Paths between the latent intercept factors and alcohol use are set to 1.0. The paths between the ''individual-level'' marital status variables (whether an individual married or divorced in the previous year) and each latent change variable were freely estimated and represented the degree to which one's overall trajectory of alcohol consumption was disrupted by a change in one's own marital status.

Finally, these latent change variables were also regressed onto indicators of whether any sibling in the nuclear family married or divorced at that age. This is not to imply that a sibling's change in marital status directly causes a change in one's own drinking. Rather, these ''family-level'' variables were used as a proxy for between-family genetic or environmental differences that could have influenced the likelihood of getting married or divorced (i.e., whether one comes from the ''type'' of family that tends to marry or divorce). Including

Table 2. Unstandardized Parameter Estimates for Best-Fitting Model ($N = 5{,}150$).

	Alcohol Consumption
Level factor[a]	
Intercept	12.61 (1.03)*
	[23.83 (1.50)*]
Variance	26.94 (16.37)
	[405.82 (26.39)*]
Regression on Black race	−11.48 (1.20)*
	[−14.22 (2.39)*]
Regression on Hispanic ethnicity	−7.46 (1.53)*
	[−6.27 (2.55)*]
Linear slope factor[a]	
Intercept	.43 (.30)
	[1.69 (.47)*]
Variance	2.24 (.72)*
	[1.41 (.91)]
Regression on Black race	1.05 (.40)*
	[.54 (.79)]
Regression on Hispanic ethnicity	0.34 (.46)
	[−1.02 (.78)]
Quadratic slope factor[a]	
Intercept	−.04 (.02)
	[−.15 (.03)*]
Variance	−.02 (.01)*
	[.07 (.01)*]
Regression on Black race	−.02 (.03)
	[.07 (.06)]
Regression on Hispanic ethnicity	−.01 (.03)
	[.17 (.06)*]
Marriage	
Within-family effect	−5.15 (.47)*
Between-family effect	−.72 (.30)*
Divorce	
Within-family effect[a]	3.86 (.94)*
	[9.08 (2.18)*]
Between-family effect	−.26 (.54)

Note. Parameter estimates for alcohol consumption from Model 9 (Table 3).
[a]Parameter estimates for females, followed by estimates for males in brackets. All other estimates did not differ between males and females.
*$p < .05$.

the family-level indicator of marriage allows for stronger inferences to be made about the relation between changes in one's own marital status and change in alcohol consumption: Controlling for between-family differences in propensity to get married (family-level marriage), does a change in one's own marital status still predict a decline in alcohol consumption? To the extent that unmeasured genetic or environmental selection factors that differed between families accounted for the association between marriage/divorce and alcohol use, we would expect that all the siblings from the "type" of nuclear family who gets married or divorced—even the ones who do not themselves experience this transition—would show an equivalent decline in alcohol use (a between-family effect). In contrast, if marital transitions exert a "true" effect, we would expect that siblings who differ in marital status would show a corresponding difference in alcohol consumption (a within-family effect). By integrating these individual- and family-level indicators of marriage into the latent growth model, we test whether siblings who *become* discordant for marital status also diverge in their trajectories of alcohol use.

Moderation by Age. A series of model comparisons, shown in Table 3, was conducted to determine whether developmental stage moderated the relationship between marital status and alcohol consumption. First, a model (Model 1) was estimated in which the between- and within-family effects of marriage and divorce were fixed to equality across four age groups: 19–21, 22–24, 25–27, and 28–30. These age groups were chosen to detect trends in the effect of marriage across different stages of emerging adulthood, from the period before the legal drinking age (ages 19–21) to the end of early adulthood (ages 28–30). Model 1 was compared to successive models that freed each of these effects across age groups, to determine whether freeing parameters improved model fit. Results of model comparisons are shown in Table 3. The most constrained model (Model 1), in which within- and between-pair effects were constrained across age groups, fit the data well (SRMR = .026). Model 1 was compared to Model 2, which freed the within-pair (individual) effects of marriage across age groups. Model 2 (SRMR = .027) did not improve model fit, which suggests that age did not moderate the within-pair effect of marriage on alcohol use. Next, Model 1 was compared to Model 3 (SRMR = .027), which freed between-pair effects of marriage across age groups. Freeing these effects did not improve model fit; thus, Model 1 was carried forward and compared to models (Model 4, SRMR = .027; Model 5, SRMR = .027) that freed the within and between-pair effects of divorce across age groups. Allowing these parameters to vary across age groups did not improve model fit, thus Model 1 was selected as the best-fitting model for the age moderation analyses. Age at marriage did not appear to moderate the effect of marriage and divorce on drinking.

Moderation by Gender. To test for moderation by gender, we estimated a series of multiple-group models that tested whether the between- and within-family effects of marriage and divorce differed between males and females. The gender of the individual was used as the grouping variable. These multiple-group models were built around the final model from the previous step in our analyses (in which effects of marriage and divorce were consistent across age groups). The most constrained gender-moderation model (Model 6, SRMR = .058) constrained the between- and within-family effects of marriage and divorce to be equal across men and women. Model 6 was compared to models that freed these effects across gender. Model fit comparisons are shown in Table 3. Freeing the within- or between-pair effects of marriage across gender (Model 7, SRMR = .058; and Model 8, SRMR = .058) did not improve model fit, indicating that these effects were not moderated by gender. Freeing the within-pair effects of divorce across gender (Model 9, SRMR = .058) did improve model fit. The effect of divorce on alcohol consumption was greater for men: Getting divorced predicted an increase of 9.08 drinks per month

Table 3. Alcohol Consumption: Results From Model Comparisons Testing Moderation by Age and Gender ($N = 5{,}150$).

Model Comparison	Parameter of Interest	Difference in Model Fit $\Delta\chi^2$ (Δdf, p)	Preferred Model
Moderation by age			
1 vs. 2	Within-family effect of marriage	6.8 (3, .08)	Model 1
1 vs. 3	Between-family effect of marriage	2.0 (3, .57)	Model 1
1 vs. 4	Within-family effect of divorce	3.2 (3, .36)	Model 1
1 vs. 5	Between-family effect of divorce	2.0 (3, .57)	Model 1
Moderation by gender			
6 vs. 7	Within-family effect of marriage	0.4 (1, .53)	Model 6
6 vs. 8	Between-family effect of marriage	0.5 (1, .92)	Model 6
6 vs. 9	**Within-family effect of divorce**	**11.0 (1, <.001)**	**Model 9**
9 vs. 10	Between-family effect of divorce	0.5 (1, .92)	Model 9

Note. Significant differences in model fit are in boldface.

for men and 3.86 drinks per month for women. Finally, the between-pair effects of divorce were freed across gender (Model 10, SRMR = .058), which did not improve model fit. There was a small but significant between-family effect of marriage on alcohol use. A sibling getting married was associated with a decline of 0.7 drinks per month. This suggests that part of the relation between marriage and reduced drinking is due to family-level confounds—being the "type" of family that marries in young adulthood. The between-family effects of divorce were not significant, suggesting that the increases in consumption following divorce were not due to family background factors for men or for women.

Thus, the best-fitting final model (Model 9, parameter estimates summarized in Table 2) showed that getting married predicted a reduction in alcohol use of approximately five drinks per month, an effect that was consistent across ages 18–30 and across gender. Overall, the final model for alcohol consumption fit the data well (SRMR = .058). Getting divorced predicted an increase in alcohol consumption, particularly for men.

Discussion

The current study provides further support for the hypothesis that marital transitions are associated with changes in alcohol consumption. This study utilized a sibling-comparison design to control for unmeasured selection factors, including partial control for between-family genetic differences, which are often not controlled for in standard epidemiological studies. This constitutes a rigorous test of the marriage effect. Notably, even after controlling for between-family differences in propensity to get married by comparing siblings raised in the same family, marriage remained associated with a decline alcohol use. For both males and females, marriage led to reductions of approximately five drinks per month.

Broadly speaking, our results support the "role socialization" hypothesis (Yamaguchi & Kandel, 1985), which posits that as young adults undergo major developmental transitions, such as marriage, they modify behaviors, such as heavy alcohol use, that are incompatible with these new social roles. At the same time, we found a significant family-level effect of marriage on alcohol use: Changes in alcohol use were associated not only with one's own marital status but also with the marital status of one's sibling. This suggests that between-family differences account for part of the association between marriage and alcohol use; the "types" of families that tend to marry in early adulthood also tend to drink less than families that delay marriage. Controlling for these between-family differences, individuals appear to reduce alcohol use following transitions into marriage.

Furthermore, our results suggest that the protective effect of marriage may be attenuated or reversed following divorce. After controlling for between-family differences, getting divorced predicted an increase in approximately nine drinks per month for men and four drinks per month for women. These estimates are consistent with population-based longitudinal studies, which have also found evidence for increased alcohol use following divorce (Bachman et al., 1997; Temple et al., 1991).

We found that, in both men and women, the association between divorce and increased alcohol consumption could not be attributed to between-family differences in selection factors. These results are inconsistent with previous sibling-comparison research by Prescott and Kendler (2001), who found that the association between divorce and increased alcohol use was partly due to background factors that existed prior to divorce. Prescott and Kendler used a sample of twins (rather than non-twin siblings), a design that controls for a greater portion of genetic and thus is better powered to detect selection effects. A co-twin control is preferable in that it allows one to control for selection effects that twins share because they are of the same age and gender. Moreover, the current study used an ethnically and racially diverse sample that was representative of the population, whereas Prescott and Kendler (2001) used a sample comprised entirely of White females. Given these conflicting findings and the differences between samples, it appears that the "divorce effect" merits further genetically informed research.

The current study found that the effect of marital status on alcohol consumption was not moderated by age at marriage. These results are consistent with one of the few studies of marital timing (Bogart, Collins, Ellickson, Martino, & Klein, 2005). However, our sample was restricted to ages 18–30, and it is possible that moderation would be found if a broader age

range had been included. In particular, the current study excluded individuals who reported marital transitions prior to age 18. These early marriages may reflect an underlying propensity for risky behavior; thus, it is possible that the within-pair effect of marriage on alcohol use would be attenuated in this group. Although they did not directly test for a moderating effect of marital timing, Prescott and Kendler (2001), using a sample of women ages 17–51, found that after age 30, marital status was not significantly associated with variability in alcohol consumption. The average age at marriage is increasing, with more people marrying after age 30, and thus the effects of later marriage on alcohol use should be tested in an updated sample spanning a broader age range.

The effect of divorce on alcohol consumption was moderated by gender, with greater increases in drinking seen in men. This is consistent with a limited body of research on gender-specific effects of marriage dissolution on alcohol use (Horwitz et al., 1996; Keyes, Hatzenbuehler, & Hasin, 2011; Reczek et al., 2012). Several theories may account for this effect. Divorce is generally a stressful life event for both men and women (Booth & Edwards, 1985) and places both men and women at risk for psychopathology (Chatav & Whisman, 2007). In men, this is generally manifest in externalizing behavior, such as substance abuse, while women are more likely to develop internalizing problems, such as depression and anxiety disorders (Cooper, Russell, Skinner, Frone, & Mudar, 1992; Dawson, Grant, & Ruan, 2005). In fact, for women, divorce may lead to reductions in drinking, as it involves separation from a powerful contextual motivator for increased alcohol use (Leonard & Eiden, 1999). Women may also drink in response to marital stressors, caused, for example, by intimate partner violence or a spouse's alcohol problems. In this case, divorce may lead to a remission of marital distress, which, in turn, may lead to reductions in drinking (Wilsnack, Klassen, Schur, & Wilsnack, 1991). Research examining gender-specific causal relationships between marital transitions and alcohol use must also consider gender-specific patterns of selection and socialization.

Several limitations of the current study must be noted. First, there are many variables that may account for the within-family marriage "effect," including other developmental transitions such as having a child, graduating from college, and starting a career. In their study of declines in alcohol use in young adulthood, Bachman and colleagues (2002) found that the marriage effect persisted when controlling for these other transitions. However, there are still numerous within-family differences (i.e., environmental and genetic factors that make two siblings different), which are difficult to control for in any design, no matter how rigorous. The sine qua non of causal inference—a true experiment with random assignment to the marital transition—is, of course, impossible. Thus, like any other quasi-experimental design, the current study cannot definitively establish a causal influence of marriage on alcohol use; rather, we can only state that our results remain consistent with such an effect, even after a rigorous control for between-family differences and preexisting trajectories of alcohol use. A same-sex twin sample would provide a more rigorous test of causality, as it would allow control of all genetic factors and of all the experiences that siblings share due to being both in the same family and the same age and gender. Without using a twin sample, we are unable to measure genetic associations between alcohol consumption marital transitions and we were unable to control for remaining genetic differences between siblings.

Second, the current analysis used data collected in the 1980s and is therefore subject to possible cohort effects. We focused on alcohol use between ages 18 and 30, an age span that captured much of the period of "risk" for marriage at that time. (The median age at first marriage in 1982 was 25.2 for men and 22.5 for females; U.S. Census Bureau, 2011.) Currently, young adults are more likely to delay marriage until the late 20s or early 30s, and marriage is more commonly preceded by a period of cohabitation. Given the changing trends in the timing, frequency, and psychological significance of marriage in the last two decades (Fields, 2004; Nock, 2005), it is possible that the relationship between marriage and young adult alcohol use has changed as well.

Third, the primary outcome in the current study was past month alcohol consumption, which is both correlated with and qualitatively different from clinically significant alcohol-related problems. Given that change in alcohol consumption is part of a suite of normative developmental changes characteristic of young adulthood, we contend that understanding environmental influences on alcohol consumption is an important research goal in its own right. However, it is also likely that a reduction in alcohol consumption translates into a reduced vulnerability for alcohol use disorders or serious behavioral risks. Previous studies have found associations between marriage and alcohol-related problems (Bogart et al., 2005) and diagnosed alcohol use disorders (Dawson et al., 2006). In addition, Burt et al. (2010) found a similar influence of marriage on antisocial behavior in young adult men, suggesting that marriage may influence a spectrum of externalizing behaviors, rather than having specific effects on alcohol per se. Future behavioral genetic research is necessary to examine the extent to which marriage effects generalize across an array of clinical and subclinical externalizing behaviors, and the extent to which these effects are mediated through a single common process.

Finally, the influences of marriage on development are fundamentally contingent on the quality and context of the marital relationship. The current study did not use measures of marital satisfaction, which may play a critical role in this association, nor did we control for levels of spousal alcohol consumption. In assessing the importance of spousal alcohol use, it is important to distinguish between the effects of assortative mating (the tendency for individuals to select partners with similar alcohol use) and the postmarital influence of one's spouse. The limited body of research on spousal influence on drinking in community samples suggests that one's spouse's premarital and postmarital alcohol use are predictive of one's own postmarital alcohol use (Leonard & Eiden, 2007; Leonard & Mudar, 2004). Future research incorporating a sibling-comparison design could shed further light on this process.

The debate regarding role socialization versus role selection is not limited to alcohol use or to marriage; similar questions regarding the causal influences of social role changes have been posed in relation to a diverse array of outcomes, including age-related changes observed in personality (Hoffman, 1991; Kohn & Schooler, 1983), health behaviors (Todd, Chassin, Preston, & Sherman, 1996; Yamaguchi & Kandel, 1985), and psychosocial well-being (Horwitz & White, 1998; Mortimer & Borman, 1988). The combination of longitudinal and family data used in the current project is a powerful—and underutilized—tool that may be helpful in resolving these debates about environmental influences on development. The use of latent growth modeling is a powerful method for assessing the influence of a time-specific transition on a normative developmental trajectory of alcohol use in young adulthood. In addition, this study demonstrates the utility of the sibling-comparison design in reducing the ambiguity that surrounds causation in many naturalistic studies. This approach controls for between-family variation in both environmental and genetic influences, allowing researchers to draw meaningful inferences from observational data. Developmental researchers in particular can benefit from incorporating both these approaches into longitudinal analytic methods.

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Notes

1. Sensitivity analyses were conducted to assess whether excluding remarried individuals impacted results. The same pattern of results was found for both alcohol consumption and binge drinking. These results are available from the first author upon request.
2. Sensitivity analyses were conducted using same-sex siblings only, yielding the same pattern of results. Opposite-sex siblings were retained in our primary analyses, in order to maximize sample size.

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