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Role Transitions and Young Adult Maturing Out of Heavy Drinking: Evidence for Larger Effects of Marriage among More Severe Pre-Marriage Problem Drinkers

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Abstract

Background—Research has shown a developmental process of “maturing out” of problem drinking beginning in young adulthood. Perhaps surprisingly, past studies suggests that young adult drinking reductions may be particularly pronounced among those exhibiting relatively severe forms of problem drinking earlier in emerging adulthood. This may occur because more severe problem drinkers experience stronger ameliorative effects of normative young adult role transitions like marriage.

Methods—The hypothesis of stronger marriage effects among more severe problem drinkers was tested using three waves of data from a large ongoing study of familial alcohol disorder (Chassin et al., 1992; $N=844$; 51% children of alcoholics).

Results—Longitudinal growth models characterized (1) the curvilinear trajectory of drinking quantity from ages 17–40, (2) effects of marriage on altering this age-related trajectory, and moderation of this effect by pre-marriage problem drinking levels (alcohol consequences and dependence symptoms). Results confirmed the hypothesis that protective marriage effects on drinking quantity trajectories would be stronger among more severe pre-marriage problem drinkers. Supplemental analyses showed that results were robust to alternative construct operationalizations and modeling approaches.

Conclusions—Consistent with role incompatibility theory, findings support the view of role conflict as a key mechanism of role-driven behavior change, as greater problem drinking likely conflicts more with demands of roles like marriage. This is also consistent with the developmental psychopathology view of transitions and turning points. Role transitions among already low-severity drinkers may merely represent developmental continuity of a low-risk trajectory, whereas role transitions among higher-severity problem drinkers may represent developmentally discontinuous “turning points” that divert individuals from a higher- to a lower-risk trajectory. Practically, findings support the clinical relevance of role-related “maturing out processes” by suggesting that they often reflect natural recovery from clinically significant problem drinking.

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Thus, understanding these processes could help clarify the nature of pathological drinking and inform interventions.

Keywords

Alcohol; young adulthood; maturing out; marriage; role socialization

Introduction

A key finding informing a developmental understanding of pathological drinking is the dramatic reduction in alcohol use and related pathology that begins in young adulthood (Chen & Kandel, 1995; Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014; Li, Hewitt, & Grant, 2007). Despite an overall trend toward maturing out, however, a substantial subset of individuals persist in risky drinking (e.g., Caswell, Pledger, & Pratap, 2002; Jackson & Sher, 2005) and are therefore at increased risk for the escalation of drinking pathology (e.g., alcohol use disorder [AUD]; O'Neill, Parra, & Sher, 2001) and related consequences (e.g., health problems; McCambridge, McAlaney, & Rowe, 2011). Thus, an important research objective has been to advance understanding of the factors differentiating developmentally-limited versus persistent or escalating patterns of risky drinking. Toward this end, a great deal of evidence has supported the ameliorative influences of familial role transitions (e.g., marriage and parenthood; Bachman et al., 1997; Gotham et al., 2003; Staff et al., 2010), with more recent evidence for additional ameliorative influences of young adult personality maturation (Littlefield et al., 2009, 2010a, 2010b, 2012).

However, toward better understanding these mechanisms of young adult maturing out, one problem is the lack of research characterizing the types of drinkers who are most strongly affected by these mechanisms. For instance, there is indirect evidence suggesting that at least some mechanisms of maturing out may be strongest among especially severe problem drinkers. This view is implied by evidence that particularly severe emerging adult problem drinkers show the most substantial drinking-related declines during the subsequent transition to young adulthood (Jackson, Sher, Gotham, & Wood, 2001; Lee, Chassin, & Villalta, 2013). If specific maturing out mechanisms have especially strong effects on severe problem drinkers, this would have considerable practical relevance. It would suggest that a better understanding of these mechanisms would help clarify the nature of pathological drinking and inform policy and clinical interventions (Watson & Sher, 1998). These are key public health objectives, as AUDs are among the most prevalent mental health problems in the U.S. (Kessler et al., 2005), with problem drinking costing \$224 billion annually (Bouchery et al., 2011) and representing the third leading preventable cause of mortality (Mokdad et al., 2004).

Might Role Effects on Drinking Vary by Initial Problem Drinking Severity?

By far the most commonly offered explanation for young adult maturing out is that drinking-related reductions are driven by transitions into adult roles like marriage, parenthood, and employment (Bachman et al., 1997; Sher & Gotham, 1999; Schulenberg, Maggs, & O'Malley, 2003). Young adulthood is a period marked by relatively widespread

acquisition of these adult roles (Bachman et al. 1997), and developmental theory views successful adaptation to these roles as a key developmental task of young adulthood (e.g., Crain, 2011; Erikson, 1968). Indeed, both marriage and parenthood have generally been supported as influences on young adult drinking-related reductions, although less support has been found for employment (Bachman et al., 1997; Curran, Muthen, & Harford, 1998; Gotham et al., 2003; Lee, Chassin, & MacKinnon, 2010; Neve, Lemmens, & Drop, 2000; Staff et al., 2010).

Role incompatibility theory (Yamaguchi & Kandel, 1985a, 1985b) is often referenced to explain how and why these roles influence maturing out. This theory holds that, when a state of conflict exists between a behavior and the demands of a social role (i.e., role incompatibility), this can initiate a process called role socialization whereby conflict is resolved through changes in the behavior (Thornton & Nardi, 1975; Turner, 2001; Yamaguchi & Kandel, 1985a, 1985b). Most important for the current study, role incompatibility theory may explain past evidence for greater maturing out among more severe emerging adult problem drinkers. That is, more severe problem drinkers would likely experience greater conflict in relation to the norms and obligations of new roles like marriage, thus likely requiring more substantial changes in their drinking behaviors to alleviate this conflict and adapt to these new roles (Lee et al., 2013).

As argued above more broadly, this is a critically important hypothesis to investigate, as confirmation of this hypothesis would firmly establish the clinical relevance of young adult role-related pathways to maturing out. In contrast, the clinical relevance of role-related maturing out would be less clear if roles were found to predominantly influence initially moderate- or low-risk drinkers with relatively minimal impact on more severe problem drinkers. This would suggest that other pathways to maturing out may be more pertinent for understanding clinically-significant natural desistance and informing intervention efforts. Thus, the current study investigated the hypothesis that marriage has stronger ameliorative effects on drinking reductions among those with relatively severe patterns of pre-marriage problem drinking.

Materials and Methods

Participants

Participants were from a larger ongoing longitudinal study of familial alcohol disorder (Chassin, Barrera, Bech & Kossak-Fuller, 1992; Chassin, Flora & King, 2004; Chassin, Pitts, DeLucia, & Todd, 1999; Chassin, Rogosch & Barrera, 1991). At Wave 1, the total sample ($N=454$; $M_{\text{age}}=12.7$; $SD_{\text{age}}=1.45$) consisted of 246 children of alcoholics (COAs) and 208 demographically matched non-COAs. Data were collected annually for Waves 1 through 3, and then at five year intervals for Waves 4 through 6. Full-biological siblings were included as additional participants at Waves 4 ($n=327$), 5 ($n=346$), and 6 ($n=349$) if they were within the same age range as the original participants. Sample retention was excellent, exceeding 90% across Waves 4, 5, and 6. Retention was unbiased by sex or ethnicity but was slightly poorer for COAs than for non-COAs at Waves 4 and 5 but not 6.

The current sample—Analyses utilized data from Waves 4–6 ($N=844$). Given the key objective of testing pre-marriage drinking as a moderator of subsequent marriage effects, analyses excluded those who had already become married by Wave 4 ($n=155$; 18.4%) and those who otherwise lacked pre-marriage drinking assessments due to missing data ($n=74$; 8.8%).¹ Following this exclusion, the final sample ($N=615$) had mean ages of 20.6 ($SD=2.1$), 26.0 ($SD=2.2$), and 32.3 ($SD=2.4$) at Waves 4, 5, and 6, respectively; and was 51.4% COAs, 55.8% male, 72.2% non-Hispanic Caucasian, 25.3% Hispanic, and 30.7% college graduates by Wave 6.

Recruitment

COA families were recruited using court records of DUI arrests, health-maintenance organization wellness questionnaires, and community telephone screenings. Parental lifetime alcohol abuse or dependence was confirmed via a computerized structured interview (Diagnostic Interview Schedule, version III; Robins, Helzer, Croughan, & Ratcliff, 1981) or via spousal reports for non-interviewed parents (using Family History Research Diagnostic Criteria; Endicott, Anderson, & Spitzer, 1975). Reverse directories were used to locate potential non-COA families in the same neighborhoods as COA families, and telephone screening was used to match non-COA families to COA families on ethnicity, family structure, adolescent's age, and socioeconomic status. Computerized structured interviews were used to confirm that neither parent in potential non-COA families met lifetime criteria for alcohol abuse or dependence. For information on sample representativeness, see Chassin et al. (1991, 1992).

Procedure

Data were collected via computer-assisted in-person interviews by trained project personnel. Family members were typically interviewed simultaneously and in separate rooms to avoid contamination and to increase privacy. Telephone interviews were used for participants who had relocated out-of-state. Confidentiality was reinforced with a Department of Health and Human Services Certificate of Confidentiality. Interviews typically lasted 1–3 hours, and participants were paid up to \$70 for each interview.

Measures

Marriage—At each wave, items assessed marital status and age of first marriage. To model marriage as an influence on subsequent drinking trajectories (i.e., to model marriage-related drinking slopes; see Results), the marriage variable used in analyses was coded at a given wave as 0 for those never married and as the number of years since first marriage for those previously married. This coding of years since first marriage was done regardless of any

¹These additional exclusions included those who (1) first became married between Waves 4 and 5 and were missing Wave 4 data ($n=46$) or (2) first became married between Waves 5 and 6 and were missing both Wave 4 and 5 data ($n=28$). Exclusion was unrelated to familial AUD, ethnicity, or Wave 4 drinking quantity. However, excluded participants were more likely to be female ($\chi^2=7.141$, $df=1$, $p=.008$), non-college-graduates by Wave 6 ($\chi^2=4.07$, $df=1$, $p=.044$), previously married at Waves 4, 5, and 6 ($\chi^2=703.05$, $df=1$, $p<.0001$; $\chi^2=215.60$, $df=1$, $p<.0001$; $\chi^2=73.32$, $df=1$, $p<.0001$; respectively), previously divorced at Waves 4, 5, and 6 ($\chi^2=82.371$, $df=1$, $p<.0001$; $\chi^2=97.353$, $df=1$, $p<.0001$; $\chi^2=66.883$, $df=1$, $p<.0001$; respectively), lower on drinking quantity at Waves 5 and 6 ($t=3.20$, $df=755$, $p=.001$; $t=2.404$, $df=755$, $p=.016$; respectively), and older at Waves 4, 5, and 6 ($t=-13.39$, $df=732$, $p<.001$; $t=-13.55$, $df=754$, $p<.001$; $t=-10.51$, $df=755$, $p<.001$; respectively). These differences likely reflect factors associated with an earlier timing of marriage (the primary exclusion criterion), thus suggests that findings may not generalize to those making relatively early marital transitions (see Limitations).

subsequent divorce or remarriage to avoid biasing results by representing only a subset of marriages (e.g., marriage without subsequent divorce). However, it should be noted that, as expected, results were similar and arguably more pronounced (both for the marriage effect and for marriage by pre-marriage problem drinking moderation) in (1) a model excluding those who ever divorced and (2) in a model controlling for divorce as a time-varying covariate (see Online Supplements Tables S1-S2 and Figures S1-S2). Of the current sample, 33.0% and 61.6% had ever been married by Waves 5 and 6, respectively; and the mean number of years since first marriage among those who were previously married was 4.04 ($SD=2.2$; minimum=0.04; maximum=12.64) at Wave 5 and 7.79 ($SD=3.78$; minimum=0.42; maximum=19.71) at Wave 6, respectively.

Drinking-related variables—To test the hypothesis of stronger marriage effects on drinking reductions among relatively severe pre-marriage problem drinkers, change in drinking was represented by drinking quantity trajectories, and pre-marriage problem drinking was represented by an index of pre-marriage alcohol consequences and dependence symptoms.

Drinking quantity was the sum of two items asking participants how much hard liquor and beer or wine (respectively) they drank on a typical drinking occasion. Response options included (0) none, (1) one, (2) two, (3) three, (4) four, (5) five, (6), six, (7) seven to eight, and (8) nine or more. Drinking quantity scores from Waves 4, 5, and 6 were used to model age-related drinking quantity trajectories. Note that similar results were found with two ancillary models replacing drinking quantity with overall alcohol consumption (quantity*frequency) and binge drinking frequency, respectively (see Online Supplements Table S3-S4 and Figures S3-S4).

Pre-marriage Problem drinking was a count of nine past-year drinking-related social consequences and seven past-year symptoms related to alcohol dependence. Problem drinking scores from Waves 4 and 5 were used to index pre-marriage problem drinking in order to test pre-marriage problem drinking as a moderator of marriage effects on drinking quantity trajectories. The temporal proximity of pre-marriage problem drinking to subsequent marriage was optimized by using data from the wave immediately preceding the transition to first marriage. Thus, pre-marriage problem drinking was represented by either Wave 4 or Wave 5 problem drinking, depending upon whether participants were first married by Wave 5 or Wave 6. This resulted in an average age of 22.8 when pre-marriage problem drinking was assessed. For participants who never became married, either Wave 4 or 5 data were used depending upon which of these time points was most proximal to the participant age of 22.8.² This resulted in average ages for this measure of 22.8 and 23.1 for those who became married at Wave 5 or 6 and for those who never married, respectively; and this difference was non-significant ($t=1.40$, $df=613$, $p=.16$).

²Although perhaps counterintuitive, it was necessary to also assign “pre-marriage problem drinking” values to participants who never became married in order to test the moderation effect of primary interest. That is, this allowed us to test whether the effect of marriage varied by pre-marriage problem drinking, as it facilitates comparison of those who do versus do not become married at different levels of initial problem drinking. Given the potential for concern that the approach used here to assign problem drinking scores to those who never married may have spuriously influenced results, it is noteworthy that similar results were obtained in a model testing Wave 4 problem drinking as a moderator of effects of marriage between Waves 4 and 5 (excluding those first married at Wave 6; see Online Supplements Table S5 and Figure S5).

Parental AUD—Participants who were classified as COAs had at least one biological, custodial parent with an AUD at Wave 1, and participants who were classified as non-COAs had no biological or custodial parents with an AUD at Wave 1 (see Recruitment section for details of parental AUD assessment).

Sex—At Waves 4, 5, and 6, participants reported their sex with response options including (1) female and (2) male. In rare cases where sex self-reports were in disagreement across waves (0.8%; $n = 5$), sex was determined based on other available information (e.g., interviewer notes).

Results

All growth models were estimated in a structural equation modeling framework using full information maximum likelihood estimation to include participants with incomplete data (using MPlus version 7.11; Muthén & Muthén, 1998-2012). All models accounted for non-normality and sibling clustering within families by using a sandwich estimator to obtain robust standard errors (i.e., Mplus option TYPE=COMPLEX with MLR estimation). Age-related growth in drinking quantity was modeled using random slopes to account for individually-varying ages within study waves (i.e., Mplus option TSCORES), thereby allowing the estimation of both linear and quadratic drinking quantity trajectories. All age variables were centered such that the growth intercept reflected drinking quantity at age 35 in order to limit covariance of the growth intercept with the pre-marriage problem drinking index.

Unconditional growth models

Preliminary analyses contrasted intercept-only, linear, and quadratic growth models of age-related change in drinking quantity from age 17 to 40 (see Table 1). Likelihood ratio (L^2) nested model tests showed superior fit for the quadratic model (see Table 1 notes), so this model was retained and all subsequent models were built upon it. See Figure 1 for plots of the overall sample's average model-implied drinking quantity trajectory (upper left panel) and for a corresponding descriptive plot (lower left panel).

Testing the marriage effect

The impact of marriage was modeled by estimating an additional marriage-related growth slope reflecting additional change in drinking quantity following the transition to marriage (see Table 2). The marriage variable was coded at each wave as 0 for those never married and as the number of years since first marriage for those previously married (see Measures). A single random effect was estimated for this variable by modeling it as a time-varying covariate (Muthén & Muthén, 1998-2012). This provides a single estimate of added drinking quantity change beginning at the transition to marriage above and beyond change captured by the age slopes (for another example of this approach, see Little, Handley, Leuthe, & Chassin, 2009). The quadratic effect of this marriage variable was also modeled as another random effect to allow for a curvilinear marriage-related deflection in drinking quantity trajectories. Note that with these added marriage effects included in the model, the age-related intercept and slopes represent the model-implied trajectory for individuals who

consistently remained unmarried. The marriage effect, then, reflects deflection away from this trajectory beginning at the transition to marriage. To control for distal influences of parental AUD and sex, these variables were included as predictors of the age-related random intercept, linear slope, and quadratic slope; and as predictors of the linear and quadratic marriage-related random slopes. Through their inclusion as predictors, this also tests parental AUD and gender as moderators of these age and marriage effects. When testing marriage effects on drinking quantity, of particular interest was the Wald χ^2 test simultaneously assessing whether the linear and quadratic marriage effects were both significantly different from zero (i.e., the Wald χ^2 tests of whether model fit would be significantly reduced by constraining both of these effects to zero). This is because these two effects, together, reflect marriage's overall influence on drinking quantity trajectories.

Results showed that both the linear and quadratic marriage effects were significant, and most importantly, the Wald χ^2 test of both of these effects simultaneously was significant ($\chi^2(2)=13.401$, $p=.001$; see Table 2). The interpretation that becoming married predicted reductions in drinking quantity was further supported by plots of model-implied drinking quantity trajectories (see upper right panel of Figure 1) and corresponding descriptive plots representing the marriage effect (see lower right panel of Figure 1).

Testing marriage effect moderation by pre-marriage problem drinking

The model described above for testing the overall effect of marriage was re-estimated with pre-marriage problem drinking included as an additional predictor (i.e., moderator) of the age-related intercept, linear slope, and quadratic slopes; and the linear and quadratic marriage-related random slopes (see Table 3). When testing marriage effect moderation by pre-marriage problem drinking, of particular interest was the Wald χ^2 test simultaneously assessing whether pre-marriage problem drinking moderated both the linear and quadratic marriage effects (i.e., Wald χ^2 tests of whether model fit would be significantly reduced by constraining both of these moderated effects to zero). This is because these two effects, together, reflect the extent to which pre-marriage problem drinking moderates marriage's overall influence on drinking quantity trajectories.

Results supported the prediction that marriage would have a stronger effect among more severe pre-marriage problem drinkers. Pre-marriage problem drinking significantly moderated the linear years married effect and marginally significantly ($p<.10$) moderated the quadratic years married effect; and most importantly, the Wald χ^2 test of both of these moderated effects simultaneously was significant ($\chi^2(2)=24.72$, $p<.0001$; see Table 3). Probing this interaction further supported the interpretation of stronger marriage effects among more severe pre-marriage problem drinkers. Specifically, Wald χ^2 tests of conditional marriage effects (see Table 3) showed that marriage's effect was non-significant at a low level of pre-marriage problem drinking (i.e., at a value of 0) and significant at both moderate and high levels of pre-marriage problem drinking (i.e., at values of 0.95 and 2.90, respectively). Further, a pattern of increasingly strong marriage effects at increasingly high levels of pre-marriage problem drinking was confirmed by plotting model-implied drinking quantity trajectories representing the marriage effect at different levels of pre-marriage

problem drinking (see upper panels of Figure 2). Corresponding descriptive plots also confirmed this pattern (see lower panels of Figure 2).³

Discussion

To our knowledge, this is the first study to demonstrate that young adult transitions into roles like marriage have stronger effects on maturing out among those who were particularly severe problem drinkers prior to the role transition. This hypothesis was based in part on past research showing that young adult drinking-related reductions are particularly pronounced among relatively severe emerging adult problem drinkers (Jackson et al., 2001; Lee et al., 2013). Lee et al. (2013) speculated that this pattern might be explained by greater young adult role effects among more severe pre-role problem drinkers, and this is precisely what was shown in the current study. Moreover, as noted earlier, this finding was confirmed with a number of alternative measures and alternative modeling approaches (see Online Supplements). This not only supports the statistical reliability of this finding. It also suggests robustness of this phenomenon because the same conclusions were reached (1) when modeling change in different dimensions of alcohol involvement (overall alcohol consumption, typical drinking quantity, and binge drinking frequency), (2) with or without accounting for the influence of divorce, and (3) when tested at different periods of developmental (i.e., using different study waves).

Considering statistical artifacts as possible alternative explanations

Regression to the mean among more severe early problem drinkers is an unlikely alternative explanation for our findings. Regression to the mean may indeed be expected to produce greater drinking quantity declines among more severe early problem drinkers (Campbell & Kenny, 1999). However, our analyses contrast those who do versus do not become married within different levels of early problem drinking. As regression to the mean would equally affect the change observed among all particularly severe early problem drinkers, it is unlikely that this could have inflated the contrast of those who did versus did not become married within the group of particularly severe early problem drinkers. It is also unlikely that *floor effects* explain the weaker marriage effect among particularly low-severity problem drinkers because our drinking quantity measure's response options are particularly nuanced at low levels and include a true value of zero (zero drinks; see Measures). Thus, it is unlikely that this measure greatly obscured variability at the low end of this construct's distribution. In contrast, *ceiling effects* are more plausible, as our drinking quantity measure is less nuanced at high levels (the two highest response options are “7-8 drinks” and “9 or more drinks”; see Measures). However, if anything, this would likely have impeded rather than facilitated confirmation of our hypothesis. That is, the most likely impact of a ceiling effect would be to obscure escalation occurring at extreme levels of drinking quantity among

³It is noteworthy that additional simple ancillary models further confirmed this key hypothesis (see Online Supplements Table S6). The first model used data from Wave 4 and 5 and the second model used data from Waves 5 and 6. For example, the first model tested the effect of marriage between Wave 4 and 5 (stably unmarried vs. became married between waves) on Wave 5 drinking quantity, with this effect moderated by Wave 4 problem drinking (controlling for Wave 4 drinking quantity, parental AUD, and sex). Consistent with our main finding, in the first model (Waves 4 and 5), pre-marriage problem drinking moderated the marriage effect on subsequent drinking quantity such that the marriage effect was stronger among higher pre-marriage problem drinkers. In the second model (Waves 5 and 6), this moderated effect was in the same direction although non-significant ($p=.217$), but probing nonetheless revealed that the marriage effect became significant only at relatively high levels of pre-marriage problem drinking.

unmarried severe problem drinkers. This would diminish rather than enhance the appearance of stronger marriage effects among more severe problem drinkers.

Theoretical implications of findings

Role incompatibility theory—The current study's evidence for greater role effects among more severe pre-role problem drinkers is consistent with role incompatibility theory. This theory views conflict between behaviors and role demands as a key mechanism of role-driven behavior change, and more severe problem drinkers likely experience greater conflict between their drinking and the demands of familial roles like marriage (Yamaguchi & Kandel, 1985a, 1985b). In other words, more severe problem drinkers likely require more substantial changes to their drinking behaviors to alleviate role incompatibility and thereby adapt to the marital role (Lee et al., 2013). Future research should more directly evaluate this interpretation by directly measuring the construct of role incompatibility (i.e., conflict between behaviors [e.g., drinking] and the demands of a role [e.g., marriage]). Such work could test if more severe drinkers are indeed more strongly affected by new roles *because they experience greater role incompatibility*. This could also serve to further clarify role incompatibility theory, as there are various ways that the broad concept of role incompatibility could be operationalized (e.g., conflict with role-related social norms, conflict with demands of role-related obligations). The development of a role incompatibility measure would ideally address this issue, as it should involve careful consideration and empirical investigation of these different potential operationalizations.

Developmental transitions and turning points—The above interpretation of findings in light of role incompatibility theory is also consistent with the broader conceptualization of developmental transitions and turning points stemming largely from a developmental psychopathology perspective (Rutter, 1996; Schulenberg et al., 2003). From this perspective, although contextual influences often reflect or even reinforce developmental continuity of a pre-existing trajectory (Caspi & Moffitt, 1993; Gottfreson & Hirschi, 1990; Jessor, 1987), certain contextual influences reflect developmental discontinuity and thus can spur “turning points” that divert initially high-risk individuals onto lower-risk trajectories (Rutter, 1996; Schulenberg et al., 2003). Thus, familial roles may have limited impact on already low-risk drinkers because, for them, these role transitions merely reflect continuity of an already low-risk trajectory. In contrast, familial role transitions may have a more marked impact on higher-severity problem drinkers because, for them, these role transitions reflect discontinuity and thus may spark a shift from a higher- to a lower-risk trajectory (i.e., a turning point).

Findings in the context of role selection—Role incompatibility theory also notes the potential for role selection processes whereby individual characteristics influence the likelihood that individuals will adopt adult roles like marriage (Yamaguchi & Kandel, 1985a, 1985b). Interestingly, taking this notion of role selection together with the current study's findings suggests that relatively severe problem drinkers may be particularly unlikely to adopt familial roles like marriage (role selection), but when they do they will often experience particularly dramatic ameliorative effects of those role transitions (our finding). However, perhaps surprisingly, empirical evidence is mixed regarding the extent to which

substance-related risk influences young adult role selection. Past studies have often failed to show that heavy or consequential drinking decreases the likelihood of subsequent young adult role transitions (e.g., Bachman et al. 1997; Curran et al., 1998; Lee et al., 2010), although it appears that such effects are more often detected with indices reflecting highly severe problem drinking (e.g., AUDs) or involvement with other illicit substances (e.g., Flora & Chassin, 2005; Hoffman, Dufar, & Huang, 2007; Waldron et al., 2011).

Practical implications of findings

Past research has supported the clinical relevance of the maturing out phenomenon by showing age-related reductions even for indices capturing highly severe problem drinking (e.g., symptomatology and AUDs; e.g., Harford et al., 2005; Li et al., 2007), and also by showing that maturing out may primarily reflect reductions among highly severe problem drinkers (Jackson et al., 2001; Lee et al., 2013). The current study extends this by revealing the specific clinical relevance of young adult role-driven pathways to maturing out (at least for marriage). Our finding of particularly strong marriage effects among more severe problem drinkers suggests that much of the role-driven maturing out that occurs in young adulthood may truly represent natural recovery from clinically significant forms of problem drinking. Thus, a greater understanding of these role-related processes of maturing out could hold implications for clinical and public health efforts aimed at fostering similar changes.

One example of how a deeper understanding of role effects could inform intervention efforts pertains to potential clinical applications of role incompatibility theory. If future research confirms that role incompatibility drives role influences on maturing out, this would support the developmental tailoring of young adult problem drinking interventions to emphasize themes related to role incompatibility. The notion that role-incompatibility-related themes may be particularly salient (and thus clinically useful) in young adulthood is consistent with developmental theories that view successful adaptation to new adult roles as a key developmental task of young adulthood (Bachman et al., 1997; Crain, 2011; Erikson, 1968). Further, the integration of role-incompatibility-related themes into clinical practice would be consistent with the philosophy of well-supported treatment approaches like Motivational Interviewing that aim to raise awareness of discrepancies between clients' problem behaviors and their values, goals, and priorities (e.g., Miller & Rollnick, 2002). Although this is currently quite speculative, our findings suggest potential for interventions to leverage role incompatibility and other naturally occurring maturing out mechanisms in order to more effectively promote young adult problem drinking desistance.

Limitations

Although the current study makes an important contribution beyond past research, there are also limitations that should be noted. First, the quadratic parameterization of age and marriage effects may have sometimes failed to fully capture certain features of the drinking quantity trajectories. However, despite some minor discrepancies between plots of model-implied means and plots of descriptive means by age (e.g., see Figures 1 and 2), we note that both types of plots consistently supported the key conclusion of the current study. Second, although we found stronger marriage effects among more severe pre-marriage problem drinkers, our pre-marriage drinking variable did not differentiate between clinical and

subclinical levels of severity. This is an important distinction that could be more feasibly addressed in future research with a larger sample. Third, analyses excluded those who became married prior to Wave 4 because post-adolescent data on pre-marriage problem drinking are unavailable for these participants. This likely produced underrepresentation of individuals who made relatively early transitions to marriage, so findings may not generalize to these individuals. Fourth, the lack of an explicit assessment of role incompatibility makes the interpretations of our findings in light of role incompatibility theory more speculative. As discussed above, the direct confirmation of role incompatibility as a mechanism of role-related maturing out may prove to be a complex yet fruitful avenue for future research.

Conclusions

Despite the above limitations, the current study makes several contributions to research on maturing out. Findings were consistent with the novel hypothesis that young adult role effects on maturing out would be more substantial among relatively severe pre-role problem drinkers. This offers support for the view from role incompatibility theory on how role acquisition can influence changes in problem behaviors. It also supports the developmental psychopathology view of the different ways that developmental transitions can influence ongoing developmental risk-trajectories. Further, findings support the clinical relevance of role-related processes of maturing out, suggesting that a better understanding of the mechanisms of these processes could beneficially inform interventions for young adult problem drinkers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Plots depicting overall age-related changes in drinking quantity (left panels) and effects of marriage on these drinking quantity changes (right panels), using both model-implied trajectories (upper panels) and descriptive means by age (lower panels). *Model-implied trajectories* were obtained by computing model-predicted drinking quantity values at different levels of age and (for marriage trajectories) years since first marriage. For the model-implied marriage trajectories, the plot contrasts the predicted trajectory if marriage never occurred versus if first marriage occurred at age 23 (age 23 is arbitrary, as the model estimates a uniform marriage effect across ages). *Descriptive means by age* required first converting our “wide” dataset into a “long” dataset (i.e., treating each person-wave as a case). The marriage-related descriptive plot contrasts those never married throughout the study versus those who first married between ages 21 and 26 (homogeneous groups were necessary to allow clear depiction of the marriage effect). Descriptive plots show triangles for means (with connecting lines), color-coded dots for individual datapoints, bars two standard deviations from means, and smoothed loess lines with shaded 95% confidence regions.

Figure 2.

Plots depicting marriage effect moderation by pre-marriage problem drinking with model-implied trajectories (upper panels) and descriptive means by age (lower panels). *Model-implied trajectories* were obtained by computing model-predicted drinking quantity values at different levels of age, years since first marriage, and pre-marriage problem drinking. These plots contrast the predicted trajectory if marriage never occurred versus if first marriage occurred at age 23 (age 23 is arbitrary, as the model estimates a uniform marriage effect across ages), separately at low (0), moderate (0.95), and high (2.95) levels of pre-marriage problem drinking. *Plots of descriptive means by age* required first converting our “wide” dataset into a “long” dataset (i.e., treating each person-wave as a case). These plots contrast those stably never married versus those first married between ages 21 and 26 (homogeneous groups were necessary to allow clear depiction of the marriage effect), separately among those with pre-marriage problem drinking scores of 0, 1, and 2 or more. Descriptive plots show triangles for means (with connecting lines), color-coded dots for individual datapoints, bars two standard deviations from means, and smoothed loess lines with shaded 95% confidence regions.

Table 1
Results of the Unconditional Intercept-only, Linear, and Quadratic Drinking Quantity Growth Models

	Intercept-only model		Linear slope model		Quadratic slope model	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Means						
Intercept	2.771	<.001	2.525	<.001	2.418	<.001
Linear slope	--	--	-0.035	<.001	-0.082	<.001
Quadratic slope	--	--	--	--	-0.003	0.026
Covariances						
Intercept with linear slope	--	--	0.029	0.475	-0.074	0.191
Intercept with quadratic slope	--	--	--	--	-0.006	0.089
Linear slope with quadratic slope	--	--	--	--	0.001	0.449
Variances						
Intercept	3.037	<.001	3.238	<.001	2.779	<.001
Linear slope	--	--	0.004	0.409	0.016	0.544
Quadratic slope	--	--	--	--	0.000	0.242
Residual variances						
Wave 4 drinking quantity	3.188	<.001	2.980	<.001	2.153	<.001
Wave 5 drinking quantity	1.624	<.001	1.662	<.001	1.587	<.001
Wave 6 drinking quantity	1.775	<.001	1.516	<.001	1.513	<.001
Model fit indices						
Loglikelihood	-4681.020		-4666.372		-4652.902	
Number of model parameters	5		8		12	
Loglikelihood Correction factor	1.5138		1.4065		1.5780	
Akaike Information Criterion (AIC)	9372.040		9348.745		9329.803	
Bayesian Information Criterion (BIC)	9395.725		9386.640		9386.647	

Note. Given the above loglikelihood values, numbers of model parameters, and loglikelihood correction factors, Satorra-Bentler scaled likelihood ratio (L^2) nested model tests (Satorra & Bentler, 2001) supported retention of the quadratic model (intercept only vs. linear: $L^2(3)=23.863, p<.001$; linear vs. quadratic: $L^2(4)=14.023, p=.007$).

Table 2
Results of the model Testing Marriage Effects on Drinking Quantity Trajectories

	Estimate	<i>p</i> -value
Moderators of age effects		
Growth intercept moderation		
Parental AUD	0.520	.113
Sex	0.807	.009
Growth linear slope moderation		
Parental AUD	-0.062	.298
Sex	-0.002	.978
Growth quadratic slope moderation		
Parental AUD	-0.002	.484
Sex	0.003	.350
Moderators of marriage effect		
Linear years married moderation		
Parental AUD	0.047	.495
Sex	0.043	.640
Quadratic years married moderation		
Parental AUD	0.000	.934
Sex	-0.003	.757
Age and marriage effects ¹		
Growth intercept	2.771	<.001
Growth linear slope	-0.075	.014
Growth quadratic slope	-0.004	.022
Linear years married	-0.134	<.001
Quadratic years married	0.009	.004
Wald χ^2 tests of both marriage effects simultaneously	$\chi^2=13.401$	<i>p</i>=.001

Note. For parental AUD, 0=negative and 1=positive. For sex, 0=female and 1=male.

Note. Because age was centered at 35 for all three waves, the growth intercept reflects the model-implied drinking quantity level at age 35 for those who were stably unmarried. Together, age-relates intercept and slopes represent the model-implied trajectory for those who consistently remain unmarried, as the marriage effects reflect added deflection from this trajectory beginning at the transition to marriage.

¹ Because age and marriage effects were modeled as random slopes, these effects are reflected in model-resulting intercepts which represent the value for a given random effect at a value of zero on all predictors (i.e., moderators) of that random effect. Parental AUD and sex were consistently mean-centered so that so that age and marriage effects would reflect average effects across the two levels of these two covariates.

Table 3
Testing Moderation of Marriage Effects on Drinking Quantity Trajectories by Pre-Marriage Problem Drinking

	Estimate	p-value
Moderators of age effects		
Growth intercept moderation		
Parental AUD	0.288	.368
Sex	0.494	.093
Pre-marriage problem drinking	0.498	<.001
Growth linear slope moderation		
Parental AUD	-0.072	.218
Sex	-0.033	.592
Pre-marriage problem drinking	0.022	.197
Growth quadratic slope moderation		
Parental AUD	-0.003	.393
Sex	0.002	.649
Pre-marriage problem drinking	0.001	.188
Moderators of marriage effect		
Linear years married moderation		
Parental AUD	0.071	.302
Sex	0.075	.419
Pre-marriage problem drinking	-0.075	<.001
Quadratic years married moderation		
Parental AUD	-0.001	.791
Sex	-0.004	.682
Pre-marriage problem drinking	0.003	.061
Wald χ^2 test of pre-marriage problem drinking moderation of linear and quadratic marriage effects simultaneously (df=2)	$\chi^2=24.72$	$p<.0001$
Conditional age and marriage effects at different levels of pre-marriage problem drinking ¹		
Pre-marriage problem drinking=0		
Growth intercept	2.305	<.001
Growth linear slope	-0.094	.004
Growth quadratic slope	-0.005	.007
Linear years married	-0.067	.102
Quadratic years married	0.006	.090
Wald χ^2 tests of both marriage effects simultaneously (df=2)	$\chi^2=2.96$	$p=.2280$
Pre-marriage problem drinking=0.95		
Growth intercept	2.778	<.001
Growth linear slope	-0.073	.013
Growth quadratic slope	-0.004	.023
Linear years married	-0.139	<.001

	Estimate	p-value
Quadratic years married	0.009	.003
Wald χ^2 tests of both marriage effects simultaneously (df=2)	$\chi^2=15.37$	$p=.0005$
Pre-marriage problem drinking=2.90		
Growth intercept	3.749	<.001
Growth linear slope	-0.030	.523
Growth quadratic slope	-0.001	.626
Linear years married	-0.285	<.001
Quadratic years married	0.016	.001
Wald χ^2 tests of both marriage effects simultaneously (df=2)	$\chi^2=34.47$	$p<.0001$

Note. For parental AUD, 0=negative and 1=positive; for sex, 0=female and 1=male.

Note. Because age was centered at 35, the growth intercept reflects the model-implied drinking quantity level at age 35 for those who were stably unmarried. Together, age-relates intercept and slopes represent the model-implied trajectory for those who consistently remained unmarried, as the marriage effects reflects added deflection from this trajectory beginning at the transition to marriage.

¹ Because age and marriage effects were modeled as random slopes, these effects are reflected in model-resulting intercepts which represent the value for a given random effect at a value of zero on all predictors (i.e., moderators) of that random effect. Thus, conditional age and marriage effects at “low,” “moderate,” and “high” levels of pre-marriage problem drinking were obtained by re-estimating the model three times with pre-marriage problem drinking centered at zero, the mean (0.95), and the mean plus one standard deviation (2.90), respectively. Parental AUD and sex were consistently mean-centered so that age and marriage effects would reflect average effects across the two levels of these two covariates.