

# Aging and Drinking Problems Among Mature Adults: The Moderating Effects of Positive Alcohol Expectancies and Workforce Disengagement\*

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**ABSTRACT. Objective:** This article examines the relationship between aging and drinking problems among mature workers and the moderating effects of positive alcohol expectancies (PAEs) and workforce disengagement. **Method:** This longitudinal study collected data on mature adults (i.e., retirement eligible) in three employment sectors (i.e., construction, manufacturing, and transportation) over five periods: T1 was 6 months before their retirement eligibility date and T5 was 4 years afterward. At T1, 1,122 subjects participated in the survey; at T5, 917 participated in the survey. Problem drinking was assessed in all five waves by the Drinking Problems Index. PAEs were measured at T4 and T5 by the Alcohol Outcomes Expectancies Scale. Workforce disengagement was assessed by subjects' employment status at T5 (i.e., still working despite eligibility versus fully retired/not working). Control variables

were employment sector, age at T1, and gender. **Results:** PAEs moderated the relationship between aging and drinking problems: High PAEs were associated with an increase in drinking problems, whereas low PAEs were associated with a decrease in drinking problems. With regard to disengagement, continuing to work amplified the moderating effects of PAEs on the relationship between aging and drinking problems, whereas the moderating effects of PAEs were attenuated for the fully retired. **Conclusions:** This study provides further evidence of the significance of PAEs and drinking problems among mature adults, particularly as they are conditioned by disengagement from work. Implications for employee/member assistance program are discussed. (*J. Stud. Alcohol Drugs* 69: 151-159, 2008)

WITH THE AGING OF THE BABY-BOOM generation, there is growing concern that problem drinking among mature adults is likely to become a significant public health issue (Breslow et al., 2003; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2000). Nevertheless, the influence of aging on problem drinking among mature adults remains equivocal. Although a large number of studies have demonstrated that as people grow older they drink less than when they were younger and that older people tend to experience fewer alcohol-related problems than younger persons (Brennan and Moos, 1990; Grant et al., 2006; Hilton, 1987; Stall, 1987), other studies suggest that problem drinking prevalence and severity may in fact *increase* as a function of age in older populations (Atkinson et al., 1990; Brennan et al., 1999; NIAAA, 2000). Not surprisingly, therefore, the alcohol research community has recently recognized the need to identify factors potentially

conditioning the link between aging and drinking behavior (NIAAA, 2006). In the current article, we propose that alcohol expectancies—"people's beliefs about the effects of alcohol on behavior, moods and emotions" (Leigh and Stacey, 2004, p. 215)—may serve as one such conditioning factor.

Research has consistently demonstrated that alcohol expectancies in general, and *positive* alcohol expectancies (PAEs) in particular, play a significant role in explaining the initiation and maintenance of drinking behaviors across a wide variety of demographic subgroups, including older adults (Goldman, 1994; Leigh and Stacey, 2004). Moreover, there is strong and consistent evidence that affect-consumption relationships are moderated by alcohol-related expectancies. For example, Cooper et al. (1992) found that PAEs amplified, and negative expectancies attenuated, the association between stressors and both alcohol use and drinking problems among male drinkers. Similarly, Johnson and Gurin (1994) found that PAEs amplify the association between depression and problem drinking.

Such conditioning effects may be highly relevant to mature adults in that, as these individuals age, they are at an ever-increasing risk of experiencing stressful life events with respect to their health (e.g., hospitalization, emergence of a chronic condition), family (e.g., death of a spouse), and economic security/employment (e.g., job loss, retirement) (Aldwin et al., 1996; Moos et al., 2004). Given individual

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differences regarding cognitive representations of the expected consequences of drinking (e.g., tension relief or mood enhancement), such aging-related stressors may be more likely to motivate alcohol consumption among some individuals than others (Connors and Maisto, 1988). That is, if, as suggested by the findings above, alcohol expectancies moderate the impact of stressors on problem drinking, and if we assume that aging serves as a proxy for the accumulated stress generated by more frequent exposure to higher-intensity stressful life events as mature adults age (Brennan et al., 1999), it is logical to expect that, among mature adults, such expectancies may also moderate the association between aging and drinking problems. Such a framework is consistent with the moderated stress-drinking model proposed by Frone (1999), which suggests that stressors may have varying influences on drinking behavior. The extent of such influence depends on individual difference factors, such as personality, beliefs and expectations, which shape individuals' decisions regarding the use of alcohol as a means by which to cope with or "self-medicate" any felt strain. Consequently, we posit Hypothesis 1: Among mature adults, PAEs will moderate the relationship between aging and problem drinking such that any positive relationship between aging and problem drinking will be amplified as a function of PAEs.

However, recent research suggests that the robustness of PAEs' effects cannot be taken for granted and that the impact of such expectancies on drinking behavior may itself be contingent on the accessibility of memories associating drinking with positive outcomes (Palfai and Wood, 2001). Palfai and Wood demonstrate that, although expectancy strength has the *potential* to influence drinking behavior, whether it does so depends largely on the extent to which expectancy-relevant information—associations between context, drinking behavior, and expected outcomes—is activated upon exposure to particular stimuli. To the extent that such context-drinking-outcome associations may be more salient and hence readily accessible in some situations than others, information-processing models of alcohol use suggest that expectancy strength may have inconsistent effects on drinking behavior, with expectancy effects likely to be amplified when such associations are more relevant and hence accessible, and attenuated when such associations are less relevant and hence less accessible (Palfai and Wood, 2001; Stacey et al., 1994). Applying this logic to the moderating effects of alcohol expectancies on the aging-drinking relationship suggests that the amplifying effect of PAEs on this relationship may itself be contingent on the degree to which expectancy-relevant information continues to be activated as mature adults age.

Research on work-related risk factors and drinking behavior suggests that for many individuals positive associations between drinking and outcomes are often framed

around the workplace. For example, the stress-based perspective on work-related risk factors suggests that many workers associate drinking with relief from work-based stressors (Frone, 1999). Similarly, the workplace cultures perspective suggests that for many workers alcohol is associated with a sense of camaraderie and the maintenance of an occupational community (Ames and Janes, 1987; Sonnenstuhl, 1996). To the extent that for many workers, positive alcohol-outcome associations may indeed be work-based, information-processing models of psychopathology suggest that disengagement from the workplace may result in the weakening of such associations and thus a lower likelihood that expectancy information will be activated (Beck and Clark, 1997; Roman and Johnson, 1996). And to the extent that such work-based expectancy information may be less likely to be activated among mature adults that have disengaged from the labor force (i.e., retired), we would expect any moderating effect of PAEs on the relationship between aging and drinking problems to be more attenuated relative to those remaining in the labor force. Thus, we posit Hypothesis 2: The amplification of the positive relationship between aging and problem drinking as a function of PAEs will be more attenuated among those retired mature adults relative to those mature adults remaining in the labor force.

## Method

### *Subjects*

Subjects were members of nine national and local unions representing workers in three blue-collar sectors (transportation, manufacturing, and construction) selected because the workplace cultures dominant in these sectors have been characterized as incorporating highly permissive drinking norms (Bacharach et al., 2001; Sonnenstuhl, 1996). Longitudinal survey data were collected from a sample of retirement-eligible workers in each of the unions at five times (T1-T5). Retirement-eligible workers were defined as those individuals who met their union's criteria for full retirement benefits. Because these criteria vary across unions, some study participants were, at T1, relatively young (mean age of study participants at T1 was 57, with a range of 43 to 70).

Each union provided the names, addresses, and retirement eligibility dates of all of its members eligible for retirement between May of 2001 and February of 2002. Seven of the nine unions provided phone numbers as well. T1 data were collected on the basis of computer-assisted telephone interviewing beginning in November of 2000, with all participants interviewed approximately 6 months ( $\pm 2$  weeks) before their retirement eligibility date. Although we used the entire list of names provided by the seven local unions, in the case of the two national unions, we drew a

random sample of 1,262 of the names provided. Thus, the sampling frame (total  $N = 2,812$ ) included 1,741, 748, and 323 workers employed in the transportation, manufacturing, and service sectors, respectively. Workers in the transportation and construction sectors received a letter explaining the nature of the study and inviting them to participate in the study by returning a signed consent form, with follow-up calls made to those from whom no consent form was received after 2 weeks. Workers in the manufacturing sector (for whom no phone number was provided) were contacted strictly by mail. Unfortunately, many of the addresses provided to us by the two unions in this sector were problematic, resulting in a high proportion of returned letters and a response rate of only 24% (vs 54% and 52% in the transportation and construction sectors, respectively). Overall, the total number of respondents in T1 was 1,279 (out of a target sample of 2,812; overall response rate of 46%). Of these, 933 were members of three transportation unions (i.e., railroad workers, flight attendants, and urban transport workers); 178 respondents were members of two unions in the manufacturing sector (i.e., assembly-line operators, machine operators, and skilled-trades workers); and 168 respondents were members of four unions in the building trades or construction sector (e.g., electricians, plumbers).

All T1 respondents were interviewed annually on the anniversary of their first (i.e., T1) interview ( $\pm 2$  weeks). Of the 1,279 T1 respondents, 917 participated in the T5 survey (total dropout rate of 28% over the subsequent four waves), 589 of whom were nonabstaining. Those dropping out of the sample between times T1 and T5 did not significantly differ on mean number of drinking problems reported at T1, mean quantity of alcohol consumed per drinking occasion, or mean frequency of drinking in the past month. Moreover, there was no substantial change in the composition of the sample from T1 to T5. At T1, 882 (69%) were men and 397 (31%) were women, and 76% of respondents were married. A majority of the population was white (79.5%); 11% were black, and 3% Hispanic. At T5, 610 respondents (67%) were men and 307 were women (33%); 77% were married. The percentage of white, black, and Hispanic participants at T5 was 83%, 9%, and 3%, respectively. Finally, despite their eligibility for retirement, rather than dropping out of the labor force, 40% of the T5 respondents remained in the active workforce, most in their T1 jobs.

### Measures

*Dependent variable.* Problem drinking was assessed in all five waves on the basis of the Drinking Problems Index (DPI; Bamberger et al., 2006; Finney et al., 1991) Participants were asked to respond to 17 items relating to “things that can happen as a result of their drinking” (i.e., various

drinking problems), indicating how often they experienced such an occurrence in the last 12 months with response categories ranging from “never” (1) to “often” (5). For the actual DPI scale, which is calculated by summing all the responses to all the 17 items, to have a minimum response of zero—indicating *no* drinking problems—we transformed all the items from a 1 to 5 scale to a 0 to 4 scale. Additionally, as recommended by Finney et al. (1991), to decrease the influence of two “liberal” items (i.e., “got a buzz/high” and “drink to forget worries”), responses to these two items were dichotomized (responses 0 to 2 were recoded as 0, and responses 3 and 4 were recoded to equal 1 before their inclusion in the summed, scale score). As such, the potential scoring range for the DPI was 0 to 62 (top score of 4 for 15 items plus top score of 2 for two items), with Finney et al. (1991) reporting a mean DPI score of 2.92. The DPI has excellent reliability and validity estimates (internal consistency reliability estimate of .94, cross-temporal correlation over a 1-year period of .66, and cross-sectional correlations with alcohol consumption at two points a year apart of .37 and .42). In the current study, Cronbach’s  $\alpha$  for the DPI was .83 at T1 and .81 at T5.

*Independent variable.* Aging was operationalized in terms of measurement occasion, with participants’ age increasing at each subsequent measurement occasion, that is, with the passage of time. We did this by creating a class variable coded 1 to 5 for each of the 5 years in which we collected data. In this way, the effect of aging by 1, 2, 3, or 4 years from T1 can be examined separately, without assuming a specific (e.g., linear) model for the effect of aging.

*Moderator.* PAEs were measured using Leigh and Stacy’s (1993) scale at measurement occasions T4 and T5 only. The respondents were read the following statement: “Here is a list of some effects or consequences that some people experience after drinking alcohol. How likely is it that these things happen to YOU when you drink alcohol? Please indicate how drinking alcohol would affect you. If you do not drink at all, you can indicate what you think would happen if you DID drink alcohol. When I drink alcohol it is very unlikely, unlikely, likely, very likely or certain to happen that....” A list of 17 items (e.g., “I am more accepted socially”; “I feel happy”) was then read to them. Leigh and Stacy’s original scale had 19 items divided into four subscales. We took all the items from the social, fun, and tension-reduction subscales. Instead of the four items in the sex subscale, we created two new items reading, “I find that I can be closer to my spouse/partner,” and “I am more relaxed with my spouse/partner” as pretests indicated that this older population might be reluctant to answer the original four items. Cronbach’s  $\alpha$  was .96 at both T4 and T5, indicating high and stable reliability.

Consistent with findings from previous studies indicating that alcohol expectancies are stable over time (Fromme et al., 1993; Kline, 1996; Werner et al., 1995), we found

no difference between the mean (SD) level of PAEs at T4 (mean = 2.68 [0.96]) and at T5 (mean = 2.64 [1.00];  $t = 1.03$ , 521 df,  $p = .3$ ) with a correlation of .4 ( $p < .001$ ) between PAEs at T4 and T5. Consequently, we assumed that the T5-assessed PAEs were generalizable not only to T4 but also to measurement T1 through T3 as well and ran our analyses with T5-assessed PAEs.

*Employment status.* At T5, we assessed respondents' employment status to assign them to one of the following two categories: (1) 0 = did not retire despite eligibility or (2) 1 = fully retired. Respondents were read a number of alternative possible employment statuses (e.g., deferred retirement benefits and still working for the same employer; took retirement, receiving benefits but employed part-time by a new employer; retired on full benefits and not currently working) and were asked to choose that condition that best described their current employment status. Respondents who indicated that they deferred their retirement benefits and were still working for the same employer with no change in status were coded as *still working*. Respondents who indicated that they had retired (regardless of when after T1 they did so) on full benefits and were not currently working were coded as *not working*. Respondents who indicated that they had taken retirement (i.e., were receiving benefits) but were nevertheless employed on either a full- or part-time basis by their old employer, by a new employer, or through self-employment were eliminated from the analysis regarding Hypothesis 2.

*Control variables.* We controlled for two demographic variables—age (at T1) and gender (0 = female, 1 = male)—often associated with problem drinking. In addition, because those employed in certain occupational sectors may be at greater risk for problem drinking than others, we also controlled for employment sector (i.e., transportation, manufacturing, or construction) in our analysis.

### Data analysis

As we had longitudinal data, we used the mixed-model method (SAS PROC MIXED procedure) that applies to research involving repeated measures. This method permits the covariance structure to be incorporated into the statistical model and provides the flexibility of modeling not only the means of the data (as in the standard linear model) but also the variances and covariances. It allows for repeated measures of the dependent variable over time and both fixed and time-dependent covariates as necessary. In our case, the repeated measure was the dependent variable, problem drinking, which was assessed each year for the 5 years under analysis for all nonabstaining study participants ( $n = 589$ ). Further model-specific sample size variations from this baseline of 589 (shown at the top of each column in Table 2) occurred as a result of list-wise deletion of observations owing to missing data.

Whereas Hypothesis 1 called for the testing of the interaction between aging and PAEs (Model 1 in Table 2), Hypothesis 2 called for examining the impact of working status on the moderation of the aging-problem drinking relationship by PAEs (i.e., a three-way interaction between aging, PAEs, and work status—Model 2 in Table 2). To further understand the nature of this three-way interaction, we divided the sample into two subsamples—those who had fully retired and those who were still working—and examined the moderating effect of PAEs on the aging-problem drinking relationship for each subsample separately (Models 3 and 4 in Table 2). As we wanted to examine a “clean” cut of the population into those who had retired and those still working, we eliminated from the sample all those mature adults who had retired but still worked in some form of part-time work ( $n = 72$ ).

## Results

Means, standard deviations, and correlations among the variables are displayed in Table 1. As can be seen in Table 2 (Model 1), our first hypothesis, which posited that PAEs would moderate the relationship between aging and problem drinking, was supported. Using multiple measurement occasions to model aging, the interactions between PAEs and measurement occasion (with T1 as the reference) were significant at all four time points. The variation in the magnitude of the interaction coefficients reflects the amplification or attenuation of the PAE-problem drinking relationship from one measurement occasion to the next relative to T1. Figure 1 depicts the nature of this interaction on the basis of three categories of PAEs: high (1 SD above the mean PAEs), low (1 SD below the mean), and moderate (mean PAEs). Within each category, we calculated the mean level of predicted problem drinking for all the individuals in that category at each of the five measurement occasions. Consistent with the amplification effect posited in Hypothesis 1, this figure shows that, for those with high alcohol expectancies (Level 3), the generally higher level of drinking problems increases as time passes. More specifically, between T1 and T2 there is an exacerbation of drinking problems (mean<sub>T1</sub> = 1.61, mean<sub>T2</sub> = 1.97;  $t = 4.69$ , 82 df,  $p < .001$ ) for this group. And whereas between T2, T3, and T4, there is no difference in the mean level of problem drinking, there is a second period of exacerbation for this high PAEs group between T4 and T5 (mean<sub>T4</sub> = 1.90, mean<sub>T5</sub> = 2.18;  $t = 6.83$ , 82 df,  $p < .001$ ).

In contrast, there is a relatively stable line depicting problem drinking over time for those in the medium PAE category, with a significant increase in predicted problem drinking between T4 and T5 (mean<sub>T4</sub> = 1.12, mean<sub>T5</sub> = 1.25;  $t = 8$ , 312 df,  $p < .001$ ). For those in the low PAE category, the pattern is a mirror image of the pattern for those in the high category. For this low expectancies group,

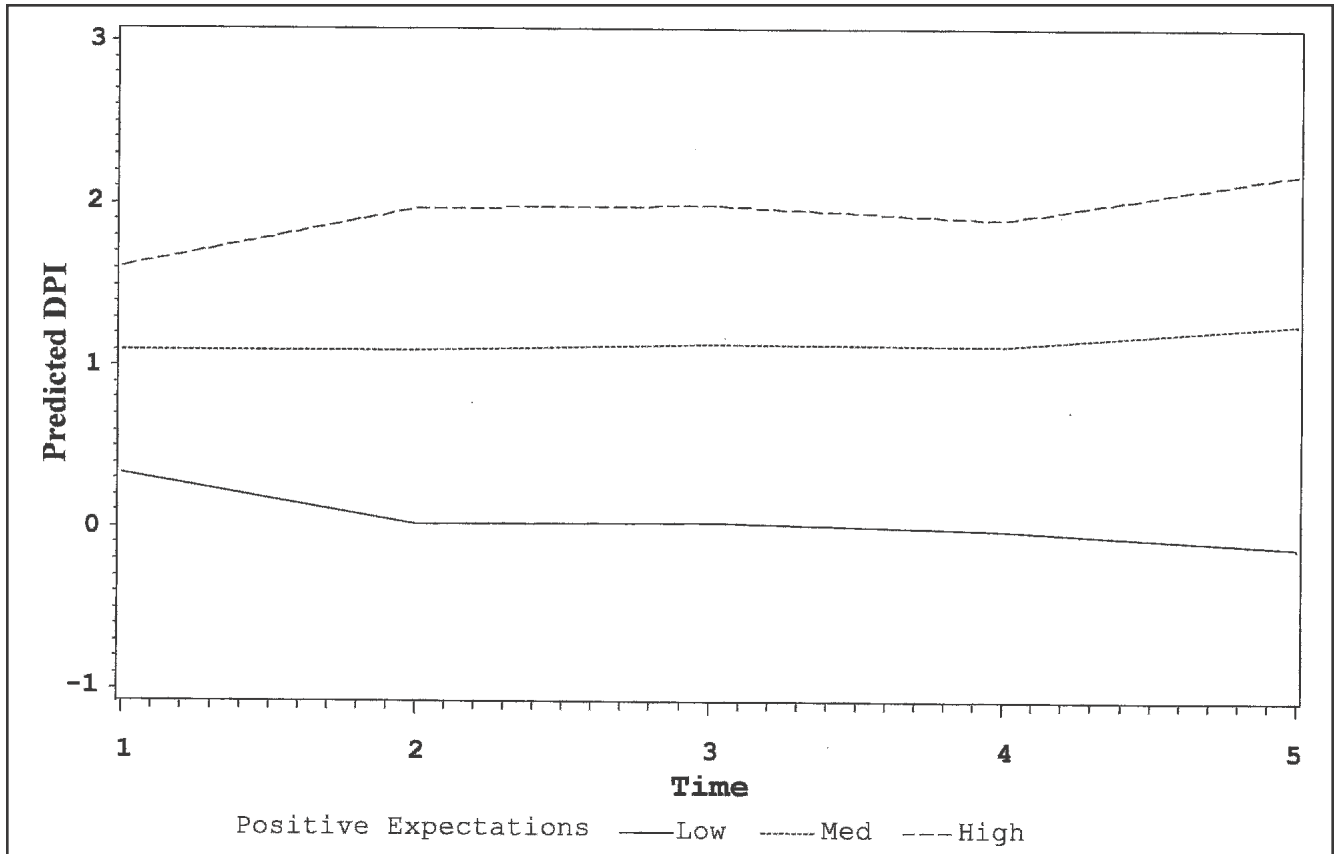


FIGURE 1. The moderating effects of positive alcohol expectancies (low = 1 SD below the mean positive alcohol expectancy [PAE] score, medium = mean PAE score, and high = 1 SD above the mean PAE score) on the relationship between aging and predicted drinking problems (DPI) among mature adults

there was a decrease in predicted drinking problems between T1 and T2 (mean<sub>T1</sub> = 0.33, mean<sub>T2</sub> = 0.01; *t* = 17.53, 104 df, *p* < .001). No difference in the mean level of predicted problem drinking was found between T2 and T4. However, between T4 and T5, a second, significant decrease in predicted problem drinking was identified (mean<sub>T4</sub> = -0.02, mean<sub>T5</sub> = -0.12; *t* = 3.72, 104 df, *p* < .01).

In this sense, although Hypothesis 1 specified only an amplification effect when PAEs are high, our results suggest the presence of an attenuation effect when expectancies are low.

To test Hypothesis 2 (which posited that the amplification of the positive relationship between aging and problem drinking as a function of PAEs would itself be attenuated among those mature adults who become eligible

TABLE 1. Descriptive statistics for the whole sample

Variable	<i>n</i>	Mean (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. DPI (Time 1)	587	0.94 (2.23)										
2. DPI (Time 2)	582	1.00 (2.70)	.65‡									
3. DPI (Time 3)	589	1.01 (2.39)	.65‡	.68‡								
4. DPI (Time 4)	581	1.01 (2.44)	.68‡	.71‡	.77‡							
5. DPI (Time 5)	575	1.08 (2.9)	.62‡	.64‡	.74‡	.71‡						
6. Age <sup>a</sup>	901	4.01 (0.95)	-.07	-.04	-.05	-.07	-.05					
7. Gender (female = 0, male = 1)	902	1.33 (0.47)	-.03	-.04	-.06	-.04	-.03	-.33‡				
8. Manufacturing vs others	902	0.16 (0.37)	.02	-.001	-.03	.03	-.004	-.3‡	-.1†			
9. Transportation vs others	902	0.72 (0.45)	-.07	-.03	-.02	-.04	.008	.27‡	.26‡	-.7‡		
10. Positive alcohol expectancies	575	2.64 (1.00)	.19‡	.27‡	.27‡	.3‡	.28‡	-.1*	-.04	.03	.009	α = .96

Notes: DPI = Drinking Problems Index. <sup>a</sup>Age was coded as follows: 1 = born 1957-1963, 2 = born 1952-1956, 3 = born 1947-1951, 4 = born 1942-1946, 5 = born 1937-1941, 6 = born 1930-1936.

\**p* < .05; †*p* < .01; ‡*p* < .001.

TABLE 2. Repeated measures regression analysis with Drinking Problems Index as dependent variable

Effect	Model 1 (PAE × Aging interaction) ( <i>n</i> = 501)	Model 2 (PAE × Aging × Work Status: three-way interaction) ( <i>n</i> = 429)	Model 3 (fully retired only) ( <i>n</i> = 276)	Model 4 (still working) ( <i>n</i> = 153)
	Estimate (SE)	Estimate (SE)	Estimate (SE)	Estimate (SE)
Intercept	0.86 (0.75)	2.48 <sup>†</sup> (0.95)	1.61 (1.12)	2.32* (1.02)
Age	-0.12 (0.12)	-0.23 (0.14)	-0.27 (0.18)	-0.15 (0.16)
Gender	-0.18 (0.24)	-0.27 (0.26)	-0.54 (0.35)	-0.46 (0.36)
Manufacturing vs others	-0.38 (0.35)	-0.57 (0.40)	-0.55 (0.55)	-0.81 (0.46)
Transportation vs others	-0.34 (0.30)	-0.47 (0.33)	-0.60 (0.45)	-0.20 (0.43)
Work status (1 = still working)		-1.49* (0.70)		
PAEs	0.45 <sup>‡</sup> (0.11)	-0.03 (0.20)	0.70 <sup>‡</sup> (0.16)	-0.02 (0.15)
Time 2	-0.59 <sup>†</sup> (0.20)	-1.08 <sup>†</sup> (0.37)	-0.32 (0.29)	-1.07 <sup>†</sup> (0.33)
Time 3	-0.61* (0.27)	-1.11* (0.52)	-0.37 (0.34)	-1.09 (0.58)
Time 4	-0.72 <sup>†</sup> (0.26)	-1.19* (0.48)	-0.51 (0.35)	-1.19* (0.48)
Time 5	-0.90 <sup>†</sup> (0.31)	-1.56 <sup>†</sup> (0.59)	-0.60 (0.42)	-1.56* (0.61)
PAE × Time 2	0.23 <sup>†</sup> (0.07)	0.46 <sup>‡</sup> (0.13)	0.11 (0.10)	0.46 <sup>‡</sup> (0.12)
PAE × Time 3	0.25 <sup>†</sup> (0.09)	0.52 <sup>†</sup> (0.18)	0.13 (0.12)	0.51* (0.20)
PAE × Time 4	0.28 <sup>†</sup> (0.09)	0.50 <sup>†</sup> (0.17)	0.18 (0.12)	0.50 <sup>†</sup> (0.17)
PAE × Time 5	0.37 <sup>‡</sup> (0.11)	0.64 <sup>†</sup> (0.21)	0.28 (0.15)	0.64 <sup>†</sup> (0.21)
Work × Time 2		0.76 (0.46)		
Work × Time 3		0.72 (0.64)		
Work × Time 4		0.67 (0.59)		
Work × Time 5		0.96 (0.73)		
PAE × Work		0.74 <sup>†</sup> (0.24)		
PAE × Time 2 × Work		-0.36* (0.16)		
PAE × Time 3 × Work		-0.38 (0.22)		
PAE × Time 4 × Work		-0.32 (0.21)		
PAE × Time 5 × Work		-0.36 (0.25)		
-2 loglikelihood	9,575.2	8,332.4	5,406.5	2,793.5

\**p* < .05; <sup>†</sup>*p* < .01; <sup>‡</sup>*p* < .001.

for retirement, disengaged from the labor force), we examined the three-way interaction between time, PAEs, and employment status. As can be seen toward the bottom of Model 2 of Table 2, this hypothesis was supported (estimate [SE] = -0.36 [0.16], *p* < .05) with respect to T2 relative to T1 (i.e., in the first year after all participants became eligible for retirement).

To further understand the nature of this three-way interaction, we split the sample into two groups based on the individuals' employment status and conducted the same analysis we had conducted to examine the association between aging and drinking problems for those in each of the two subsamples (i.e., those who by T2 had fully retired and those who at T2 were still working). Model 3 of Table 2 presents the results for those who by T2 had fully retired. For this subsample, although alcohol expectancies continued to have a main effect on problem drinking, they did not moderate the relationship between aging and problem drinking. On the other hand, as shown in Model 4 of Table 2, for those who at T2 were continuing to work despite their eligibility to retire, we found a pattern similar to that which had emerged when we examined the full sample (Model 1). That is, the graphic depiction of the interaction between time and alcohol expectancies for the still-working subsample is essentially identical to that shown in Fig-

ure 1. In sum, consistent with Hypothesis 2, whereas for those remaining in the workforce despite their retirement eligibility high PAEs appeared to amplify the link between aging and drinking problems, for those leaving the active workforce PAEs had no significant impact on the link between aging and problem-drinking. Moreover, we found an almost identical pattern of results when we reran the analyses excluding all of those subjects from the retirement subgroup who at T5 had not been retired for at least 3 years (i.e., when only those retiring by T2 and remaining retired through T5 were coded as retired in T5).

As mentioned above, based on previous research and our own data, we assumed that PAEs were stable over time and thus (in the absence of estimates of PAEs from T1 to T3) modeled T5-assessed PAEs as a moderator of the effects of aging on drinking problems. Nevertheless, it is possible that the observed effects may have stemmed from the impact of an earlier change in drinking problems on subsequent alcohol expectancies. Consequently, we ran an additional regression analysis (including the same three control variables as those included in the models reported above) that tested the effects of a change in drinking problems from T1 to T2 on the change in PAEs from T4 to T5. The results failed to support this alternative explanation ( $\beta$  for the difference in drinking problems from T1 to T2 was 0.03, NS).

## Discussion

Overall, the results presented above are consistent with our hypotheses, indicating that PAEs indeed moderate the relationship between aging and problem drinking among mature adults and that the strength of this conditioning effect is itself conditioned by the individual's employment status. More specifically, we found that for those mature adults with high PAEs, problem drinking worsened over time, whereas for those with low PAEs, aging was associated with fewer drinking problems. We also found that this conditioning effect was not universal among the mature adults examined and was significant only among that portion of the sample that, even 4 years after becoming retirement eligible, remained in the active workforce.

We believe that our findings regarding the conditioning effects of PAEs makes an important contribution to the literature on aging and alcohol misuse for several reasons. First, our findings replicate and strengthen that portion of Leigh and Stacy's (2004) findings regarding the link between expectancies and drinking with respect to mature adults. Second, our findings support the notion that PAEs not only have direct effects on drinking behavior but may also serve as a significant conditioning factor, moderating the relationship between other stress-related phenomena such as aging and drinking problems. This is significant, in that it suggests that expectancies may provide some important insights into the mixed findings regarding the aging-drinking problems association among mature adults. To the extent that this relationship is positive among those mature adults with strong positive expectancies and negative among those with less positive expectancies, alcohol expectancies may play an important role in explaining the equivocal findings to date.

As for our second finding regarding the role of employment status, as noted above, we found that the amplification of the positive relationship between aging and problem drinking as a function of PAEs is significant only for those continuing to work despite their eligibility for retirement. This finding is significant in that it provides some of the first, field-based support for the information processing notion that the role of expectancy strength may itself be conditioned by the degree to which drinking-outcome associations are more salient and hence readily accessible and that such saliency and accessibility may be context specific. To date, most of the empirical support for this notion has been derived from cross-sectional study designs using student-based data. Thus, our findings provide a certain degree of ecological validity to these earlier findings. Moreover, our findings suggest that, at least for mature adult workers whose employment exposed them to typically highly permissive drinking norms, the workplace serves as an important referent for shaping alcohol expectancies. For those continuing to work despite retirement,

these expectations play an important role in amplifying the impact of aging on drinking problems. However, as suggested on the basis of the information processing perspective, the relevance and hence saliency of such PAEs appears to diminish soon after employees disengage from their work.

As for why this is the case, we can only speculate. One possibility is that retirees comprise an older age cohort in our sample and that the saliency of PAEs is diminished for such individuals. This might occur, for example, if such positive expectancies were counterbalanced by increasing negative expectancies stemming from adverse interactions with medications. However, in testing this possibility, we found that the three-way interaction between aging (i.e., measurement occasion), PAEs, and age cohort (age category into which the participant fell at T1) was not significant, indicating that the PAE moderation of the aging-drinking problems relationship is not influenced by participants' age cohort.

Another possibility may be that having departed from the stresses and strains of work, any tension-relief expectancies have fewer relevancies to retirees than they did when the individuals were employed. Although these individuals may be subject to just as much stress in retirement, if this stress is different from that experienced at work, it may be insufficient to trigger the positive drinking-outcome association required to motivate the individual to turn to alcohol as a means by which to medicate the felt strain. Similarly, it may be that the expected social benefits of drinking may essentially disappear when the individual is distanced from those with whom he or she was used to drinking. Retirees who, while on the job, may have viewed drinking as an important means by which to bond or resolve conflict with their peers (Bacharach et al., 2002), may simply be less likely to recall such associations when confronted with new social challenges in retirement, thus making any such PAEs less salient. In sum, based on an information-processing perspective, we speculate that, particularly for those who for years were employed in contexts characterized by highly permissive drinking cultures, it may be that the PAEs developed over one's career (and regarding the role of alcohol in tension relief and in the establishment and maintenance of social relations) are so workplace specific that they have little relevance outside the workplace. As such, although these expectancies may still be strong, they are less frequently activated and hence less meaningful soon after the individual leaves the context in which they were developed and are relevant.

The above findings, particularly if replicated in other economic sectors, have important practical implications for managing mature adult employees with drinking problems. Employee and member assistance programs have always been concerned with changing workers' beliefs about drinking (e.g., Bacharach et al., 1996; Trice and Roman, 1978), and there is some evidence that they may be able to do so

(Sonnenstuhl, 1996). However, too often work organizations fail to fully implement their programs, thereby failing to confront high PAEs in the workforce, and permitting drinking problems to continue undeterred (Frone, 2006; Grube et al., 1994). Our findings suggest that employers need to redouble their efforts at modifying workers' alcohol expectancies. For example, employers may implement educational programs that directly confront older workers' high PAEs and highlight the deleterious effect of alcohol misuse on work, economic security, and, in particular, health as individuals age. Furthermore, given that, for some *retired* mature adults, high PAEs may be triggered by stressful situations, such as the death of a spouse or child or the onset of chronic health problems, employers and unions may consider the development of assistance programs specifically servicing retirees and, in particular, those retirees encountering such high-stress (and thus, high-risk) situations.

### Limitations

A number of methodological limitations suggest that our findings be taken with a degree of caution. First, our results may be generalizable only to older adults who are still working or retired from blue-collar employment settings. The degree to which our findings are robust across other employment settings remains to be studied.

A second limitation may stem from the reliance on self-reported problem drinking behavior. However, given that drinking behaviors may not always be observable to others, there is no reason to believe that reports from collateral individuals would be any more reliable or more valid (Connors and Maisto, 2003), leading Del Boca and Darkes (2003), in a recent review of the alcohol literature, to conclude that "self-report methods offer a reliable and valid approach to measuring alcohol use" (p. 1).

Finally, we examined the moderating effect of PAEs as measured at T5 and assumed that the T5-assessed PAEs are generalizable not only to T4 but to T1-T3 as well. Although, as mentioned previously, this assumption has been supported empirically in the past (Fromme et al., 1993; Kline, 1996; Werner et al., 1995), we were unable to confirm the degree of stability across *all* time periods, as we did not have PAE data at T1 through T3. Still, our post hoc analysis suggests that it is unlikely that T5 alcohol expectancies can be accounted for by prior shifts in drinking problems. Moreover, if—as suggested by the information processing perspective (Palfai and Wood, 2001)—PAEs weaken as a result of retirement, the use of post hoc PAE assessments as a proxy for preretirement PAEs should, at most, result only in the *underestimation* of the moderating effects of PAEs. Nevertheless, although we are confident in the robustness of our findings, we acknowledge that some may disagree with the use of such a proxy measure and encourage researchers in the future to model the moderat-

ing effects of PAEs over time using contemporaneous PAE assessments.

### Conclusion

Despite these limitations, our findings suggest that, by taking PAEs into account, researchers may be able to reconcile at least some of the equivocal findings in the literature regarding the association between aging and problem drinking among mature adults. Moreover, although our findings suggest that aging may be associated with an exacerbation of drinking problems among those mature adults maintaining higher PAEs, they also suggest that these expectancies may be context specific, thus potentially increasing the options for effective intervention.

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