

Drinking to Cope, Emotional Distress and Alcohol Use and Abuse: A Ten-Year Model*

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ABSTRACT. *Objective:* This study examines the ability of baseline drinking to cope to predict drinking behavior across an ensuing 10-year period. In addition, it examines whether a propensity to consume alcohol to cope with stressors strengthens the link between emotional distress and drinking behavior. *Method:* The study uses survey data from a baseline sample of 421 adults (54% women) assessed four times over a 10-year period (i.e., baseline and 1-, 4- and 10-year follow-ups). *Results:* Baseline drinking to cope was associated with more alcohol consumption and drinking problems at all four observations across the 10-year interval. Baseline drinking to cope also predicted increases in both alcohol consumption and drinking problems in the following year.

Moreover, change in drinking to cope was positively linked to changes in both alcohol consumption and drinking problems over the interval. Individuals who had a stronger propensity to drink to cope at baseline showed a stronger link between both anxiety and depressive symptoms and drinking outcomes. *Conclusions:* Findings demonstrate the power of alcohol-related coping strategies in predicting long-term drinking behavior and they illustrate one way in which such coping is linked to alcohol use and abuse. More broadly, they underscore the importance of considering individual differences in emotion-based theories of drinking behavior. (*J. Stud. Alcohol* 62: 190-198, 2001)

NEARLY ALL of the major theories of drinking and alcohol problems assume a role for emotional regulation (Lang et al., 1999). Social learning theory, for example, assumes that alcohol consumption may be one way to cope with tension and negative affect and that the use of this coping strategy predicts more drinking and alcohol abuse (Cooper et al., 1988). Drinking to cope with distress has been associated with solitary drinking practices (Smith et al., 1993) and is more likely to lead to abusive drinking than is social drinking (Abbey et al., 1993). Avoidance or emotion-focused coping has been associated with the initiation, maintenance and relapse of substance use (Wills and Hirky, 1996).

The present research examines drinking to cope with distress and alcohol use and abuse in a baseline sample of over 400 adults followed over a 10-year period. First, we investigate the ability of drinking to cope at baseline to predict alcohol consumption and drinking problems across an ensuing 10-year period. Second, we examine the role of drinking to cope in strengthening the link between emotional distress and drinking behavior.

Coping and drinking behavior

Cross-sectional studies of community samples have shown an association between avoidant styles of coping with emotional distress and increased alcohol use and abuse among both youths and adults. Avoidance coping has been linked to alcohol use among high school students (Frone and Windle, 1997) and alcohol-related problems among both high school and college students (Evans and Dunn, 1995; Wagner et al., 1999). Studies of community adults (Cooper et al., 1988, 1992) have also reported associations between avoidance coping and both alcohol use and drinking problems/abuse. Older problem drinkers were more likely than nonproblem drinkers to use cognitive and behavioral avoidance responses to manage life stressors; problem drinkers who relied more on avoidance coping tended to have more drinking problems (Moos et al., 1990a).

Findings from a series of studies on alcohol treatment outcome across 10 years have demonstrated the role of coping responses in remission and relapse (Moos et al., 1990c). In general, reliance on avoidance coping consistently predicts more alcohol consumption and a lower likelihood of abstinence. Several studies have examined coping strategies cross-sectionally among alcoholic patients after treatment. High levels of avoidance coping among alcoholic patients predicted increased alcohol use at 6 months post-treatment (Wunschel et al., 1993), whereas a preponderance of reliance on approach as compared to avoidance coping has been associated with abstinence at a 1-year follow-up (Moggi et al., 1999). In addition, the use of

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avoidance coping strategies at a 1-year follow-up partially explained the link between posttraumatic stress disorder and poorer substance use outcomes at a 2-year follow-up among male patients (Ouimette et al., 1999).

Further evidence on coping and drinking behavior has emerged from cross-sectional studies focusing specifically on drinking to cope (i.e., the tendency to use alcohol to escape, avoid or otherwise regulate unpleasant emotions) (Abbey et al., 1993). Drinking to cope has been associated with alcohol use among community adults (Abbey et al., 1993) and among a national sample of employed men (Martin et al., 1992). In a study of blue- and white-collar workers, Grunberg and colleagues (1999) reported relationships between drinking to cope and both alcohol use and alcohol-related problems.

Two studies examined drinking to cope in more complex cross-sectional predictive frameworks. In a predictive model with community adults that also included general coping skills and positive alcohol expectancies (e.g., beliefs that alcohol will reduce tension and facilitate social expressiveness), Cooper and associates (1988) found that reliance on drinking as a coping strategy emerged as the most powerful explanatory variable in the model. In a sample of community adults, Carpenter and Hasin (1999) found empirical support for a model in which the use of alcohol to cope with negative affect operated as a risk factor for developing an alcohol use disorder.

Coping, emotional distress and drinking behavior

Although individuals consume alcoholic beverages for a variety of reasons, the use of alcohol to regulate emotions represents one major class of drinking motives (Lang et al., 1999; Sher et al., 1999). Empirical findings are consistent with the view that alcohol consumption regulates emotional distress by reducing both tension and negative affect (Wills and Hirky, 1996). Therefore, the association between emotional distress and drinking behavior should be stronger among individuals who report consuming alcohol to manage emotional distress.

Some studies have examined this question in the context of emotional distress; others have examined it in the context of various stressors, which presumably operate through emotional distress. Grunberg and colleagues (1999) found that individuals who tended to think of alcohol as a way to cope with distress reported drinking more and having more alcohol-related problems in response to work stressors. Conversely, among male substance abusers, effective coping skills reduced the reciprocal link between emotional distress and substance relapse (Castellani et al., 1997).

An alternate strategy has involved examining the role of drinking to cope in mediating between emotional distress and drinking behavior. Peirce et al. (1994) found cross-sectional evidence in a large sample of adults that drinking

to cope mediated the relationship between depression and alcohol use and abuse. Wills et al. (1999) found longitudinal evidence with adolescents that substance use coping mediated the relationship between both positive and negative affect and substance (including alcohol) use.

In addition, several studies have examined emotional distress and drinking behavior from the perspective of alcohol expectancy theory. Although drinking to cope and expectancies about alcohol's effects (see Goldman et al., 1999) are distinct concepts, they are related in that positive expectancies make it more likely that individuals will use alcohol to cope with negative emotions (Cooper et al., 1988). Johnson and Gurin (1994) found that the co-occurrence of depressed mood and drinking problems was strongest among adults who most expected alcohol to elevate their mood. In a sample of college students, Kushner et al. (1994) found that men who believed that alcohol would reduce tension showed a stronger association between anxiety and drinking behavior than did men who did not hold this belief.

Cross-sectional evidence across 60 days revealed that men who expected positive outcomes from drinking reported drinking more alcohol on days with highly stressful events (Armeli et al., 2000). Frone and colleagues (1993) found that a positive cross-sectional relationship between work-family conflict and abusive alcohol consumption occurred almost exclusively among individuals who believed that alcohol use promotes relaxation and tension reduction.

The present study

Despite the consistency of previous findings, much remains to be learned about the use of alcohol as a coping mechanism. Because almost all community studies of drinking to cope have been cross-sectional, we know little about the long-term course of the coping-alcohol link. Moreover, although considerable evidence demonstrates an association between coping and drinking behavior, very few studies have systematically addressed the mechanisms linking drinking to cope with alcohol use and abuse.

The present study focuses on drinking to cope with distress and alcohol use and abuse in a baseline sample of over 400 adults followed over a 10-year period. We examine the role of drinking to cope in predicting drinking behavior both directly and as a moderator of the emotional distress-drinking behavior relationship. First, we examine the ability of baseline drinking to cope to predict drinking behavior across an ensuing 10-year period. Second, we elucidate a key mechanism in this process by examining the role of drinking to cope in strengthening the link between emotional distress and drinking behavior.

Two hypotheses are advanced. First, extending previous cross-sectional research on drinking to cope and drinking behavior (Abbey et al., 1993; Grunberg et al., 1999; Martin et al., 1992), we predict that baseline drinking to cope will

be associated with more alcohol consumption and drinking problems across the 10-year period. Second, extrapolating from previous cross-sectional research on alcohol expectancies, emotional distress and drinking behavior (Johnson and Gurin, 1994; Kushner et al., 1994; Peirce et al., 1994), we predict that drinking to cope will strengthen the associations between anxiety and depression and both alcohol consumption and drinking problems.

Method

Sample selection and characteristics

The sampling procedure involved a random selection of persons in the San Francisco Bay Area (for more detail about the sample selection procedure, see Holahan and Moos, 1987). All variables were assessed at four points in time over a 10-year period (i.e., baseline and 1-, 4- and 10-year follow-ups). Participants were contacted initially by telephone and were followed systematically by mail and telephone contact. Of those contacted at baseline, 87% agreed to participate and 84% of these ($N = 424$) provided data. Three respondents did not have data on all of the baseline variables used here, resulting in a baseline sample of 421 for the present study. Of baseline participants, 27 (6.4%) had died by the 10-year follow-up. The participation rate for respondents who were living averaged 95% at each of the three follow-up assessments. At the 1-, 4- and 10-year follow-ups, the number of participants was 404, 386 and 332, respectively (see Cronkite et al., 1998).

Individuals who continued to participate through the 10-year follow-up did not differ significantly at baseline from those who did not continue to participate on any study variables (t tests, $\alpha = 0.05$). At baseline, the sample ($N = 421$) was comprised of 231 women (54%) and 193 men (46%), and the mean (SD) age of respondents was 39 (15.6) years (range = 18-88 years). Almost half (43%) of respondents were married. The ethnic composition of the sample was primarily white (88%) and mean (SD) annual family income was \$24,000 (\$8,900).

Measures

In addition to sociodemographic data, the following five measures were used: alcohol consumption, drinking problems, drinking to cope, anxiety and depressive symptoms. All of the measures are similar to other commonly used indexes, have strong psychometric properties, good reliability, and convergent and predictive validity. Detailed descriptive and psychometric information on the measures is available in the Health and Daily Living Form (HDL; Moos et al., 1990b). For a review of studies using these measures in the context of alcoholism treatment, see Moos et al.

(1990c). For examples of studies using these measures in the context of stress and coping research, see Holahan and Moos (1987, 1990, 1991).

Alcohol consumption. Respondents were asked: "Do you drink any alcoholic beverages (wine, beer, liquor)?" and, if yes, "On the days that you drank during the past month, how much did you usually drink?" Quantity was computed separately for wine, beer and distilled spirits on 6-point scales, ranging (in the case of distilled spirits) from none (0) to 3 pints or more (5). For each beverage, the quantity codes were converted to fluid ounces and multiplied by a weight to reflect ethanol content. The weighted quantity codes for each beverage were summed to obtain an overall index of number of ounces of ethanol consumed on a typical drinking day.

Drinking problems. Drinking problems were tapped by an index of eight problems respondents experienced in the past year because of "too much drinking." Problem domains encompassed: "your health," "your job," "money problems," "family arguments," "hit someone," "trouble in the neighborhood," "trouble with the police" and "trouble with friends." The drinking problems score is the total number of items endorsed (Cronbach's $\alpha = 0.74$).

Coping strategies. Respondents were asked to pick the "most important problem" they faced during the previous 12 months and to indicate how often they used each of eight avoidance coping strategies (see Holahan et al., 1996; Moos and Schaefer, 1993) to manage it, from not at all (0) to fairly often (3). One item assessed drinking to cope ("Tried to reduce tension by drinking more"). The other seven avoidance coping items index nonalcohol-specific avoidance coping strategies and were combined into a general avoidance coping measure (e.g., "refused to believe that it happened" and "tried to reduce tension by smoking more"). Cronbach's α for the full set of eight avoidance coping strategies was 0.60; Cronbach's α for the set of seven general avoidance coping strategies was 0.54. In interpreting the internal consistency of the coping items, it should be kept in mind that the use of one coping response may reduce the need to use other responses from the same category.

Anxiety. Anxiety was tapped by an index of five symptoms experienced "fairly often" in the past 12 months, derived from Langner (1962). Examples of items are "nervousness" and "restless, couldn't sit still." The anxiety score is the total number of items endorsed (Cronbach's $\alpha = 0.71$).

Depressive symptoms. Depressive symptoms were tapped by an index of 18 symptoms experienced during the previous month, derived from the Research Diagnostic Criteria (Spitzer et al., 1978). Examples of items are "feeling depressed (sad or blue)" and "feeling guilty, worthless or down on yourself." Items were responded to on a 5-point scale reflecting how frequently they were experienced, from never

(0) to often (4). The depressive symptoms score is the sum of responses across the 18 items (Cronbach's $\alpha = 0.92$).

Results

Preliminary analysis

We first compared drinking to cope and general avoidance coping in predicting drinking behavior. We conducted hierarchical multiple regression analyses in which general avoidance coping (entered at the first step) and drinking to cope (entered at the second step) predicted alcohol consumption and drinking problems in separate analyses at each of the four assessments. With alcohol consumption, general avoidance coping was a significant predictor ($p < .01$) at three of the four assessments, predicting an average of 3% of variance; drinking to cope added significant incremental variance ($p < .01$) at all four assessments, adding on average an additional 10% of variance. With drinking problems, general avoidance coping was a significant predictor ($p < .01$) at all four assessments, predicting an average of 7% of variance; drinking to cope added significant incremental variance ($p < .01$) at all four assessments, adding on average an additional 13% of variance. Therefore, based on our conceptual focus and on evidence that drinking to cope was the stronger predictive measure, we conducted further analyses with drinking to cope.

Overview of data analysis strategy

The primary data analyses used hierarchical linear modeling (HLM) Version 4 (Bryk and Raudenbush, 1992; Bryk et al., 1996). HLM investigates the hierarchical structure of nested data (e.g., in which change processes are nested within respondents who differ on individual characteristics). For example, within individuals (Level 1), we examine relationships between time course and two drinking outcomes. Also at Level 1, we examine relationships between both depressive symptoms and anxiety and two drinking outcomes over repeated observations. These Level 1 relationships are represented by a regression equation for each individual. For example, a slope coefficient (β , unstandardized) is derived for each respondent, indicating how much that individual's alcohol consumption changes for each unit of change in time. Slope coefficients also are derived for each respondent indicating how much that individual's alcohol consumption changes for each unit of change in depressive symptoms and anxiety. The individual slopes are then regarded as a sample drawn from a population of slopes and the mean of this population of slopes is tested against a value of zero using a t ratio. The presence of significant variation among individual slopes can be detected using a chi-square statistic.

Between individuals (Level 2), we examine the association between individual differences in baseline drinking to

TABLE 1. Means (standard deviations) for the study variables

	Time 1	Time 2	Time 3	Time 4
Drinking to cope	0.31 (0.74)	0.26 (0.67)	0.29 (0.68)	0.24 (0.64)
Depressive symptoms	19.21 (11.79)	18.92 (12.55)	18.61 (12.18)	18.29 (11.47)
Anxiety	0.94 (1.30)	0.91 (1.33)	0.85 (1.22)	0.59 (1.02)
Alcohol consumption	2.55 (2.73)	2.80 (3.53)	2.52 (3.82)	1.85 (2.08)
Drinking problems	0.11 (0.56)	0.16 (0.66)	0.11 (0.57)	0.07 (0.40)

cope and the individual slope coefficients from Level 1, which now function as outcome variables. These Level 2 relationships are represented by a new regression equation indicating the strength of association between baseline drinking to cope and the individual slope coefficients from Level 1. For example, a slope coefficient (γ , unstandardized) is derived indicating how strongly baseline drinking to cope is associated with the time-alcohol consumption relationship, and whether this slope differs from 0 is tested by a t ratio. Slope coefficients also are derived indicating how strongly baseline drinking to cope is associated with the depressive symptoms-alcohol consumption relationship and with the anxiety-alcohol consumption relationship, and the significance of these relationships and whether this slope differs from 0 is tested by a t ratio.

HLM estimates parameters where some data are missing and, with the exception of analyses using the anxiety measure, the HLM analyses include between 360 and 421 respondents. Anxiety did not vary across time for many respondents and, because slopes could not be calculated for these cases, the anxiety analyses include fewer respondents ($n = 252$). Table 1 shows means and standard deviations for the study variables across the four observations. (There were 40 participants who reported no alcohol consumption at all observations for which they provided data. The primary analyses testing the study hypotheses were repeated excluding these abstainers and the results reported below were unchanged.)

Overall time course of drinking behavior

We initially tested Level 1 HLM models (i.e., unconditional models with no Level 2 predictors) with the full sample to describe the overall pattern of change in drinking behavior across the 10-year interval (the n for this set of analyses is 360). In separate models, time was used as a predictor of each drinking outcome. As an illustration, mean alcohol consumption and drinking problems at each observation are shown in the top two panels of Figure 1. A piece-wise solution (baseline to Year 1 vs Years 1-10; see Bryk and Raudenbush, 1992, pp. 148-151) provided a better fit than did a linear solution with both alcohol con-

sumption ($\chi^2 = 81.80, 3 \text{ df}, p < .01$) and drinking problems ($\chi^2 = 22.52, 3 \text{ df}, p < .01$). Between baseline and Year 1 there were marginal increases in both alcohol consumption ($\beta = 0.30, t = 1.87, p = .07$) and drinking problems ($\beta = .04, t = 1.44, p = .15$). During the subsequent 9 years there was a significant decrease in both alcohol consumption ($\beta = -0.11, t = -4.78, p < .01$) and drinking problems ($\beta = -0.009, t = -2.27, p < .05$).

Drinking to cope and the time course of drinking behavior

Level of drinking behavior. To examine the role of drinking to cope, we introduced baseline drinking to cope as a Level 2 predictor of drinking behavior. We then conducted contrasts to examine the effect of drinking to cope at each time-point (the n for this set of analyses is 421). Drinking to cope at baseline significantly predicted both higher alcohol consumption and more drinking problems at all four

observations (t tests using dummy-coded contrasts, $p < .05$, Bonferroni corrected). As an illustration, mean alcohol consumption and drinking problems at each observation are shown as a function of contrasting levels of drinking to cope at baseline (bottom two panels of Figure 1). Drinking to cope is contrasted at scores of 0 ($n = 345$) versus 2 or more ($n = 41$); individuals with drinking to cope scores of 1 ($n = 35$) fit an intermediate pattern. At a descriptive level, Figure 1 shows that baseline drinking to cope becomes a weaker predictor of both drinking outcomes as the predictive time lag increases.

Change in drinking behavior. The previous analyses suggested that drinking to cope at baseline might be associated with an increase in alcohol consumption and drinking problems in the subsequent year. To examine this possibility, at Level 1 we used time to predict drinking outcomes at baseline and the 1-year follow-up, with drinking to cope at baseline as a Level 2 predictor of the time-drinking out-

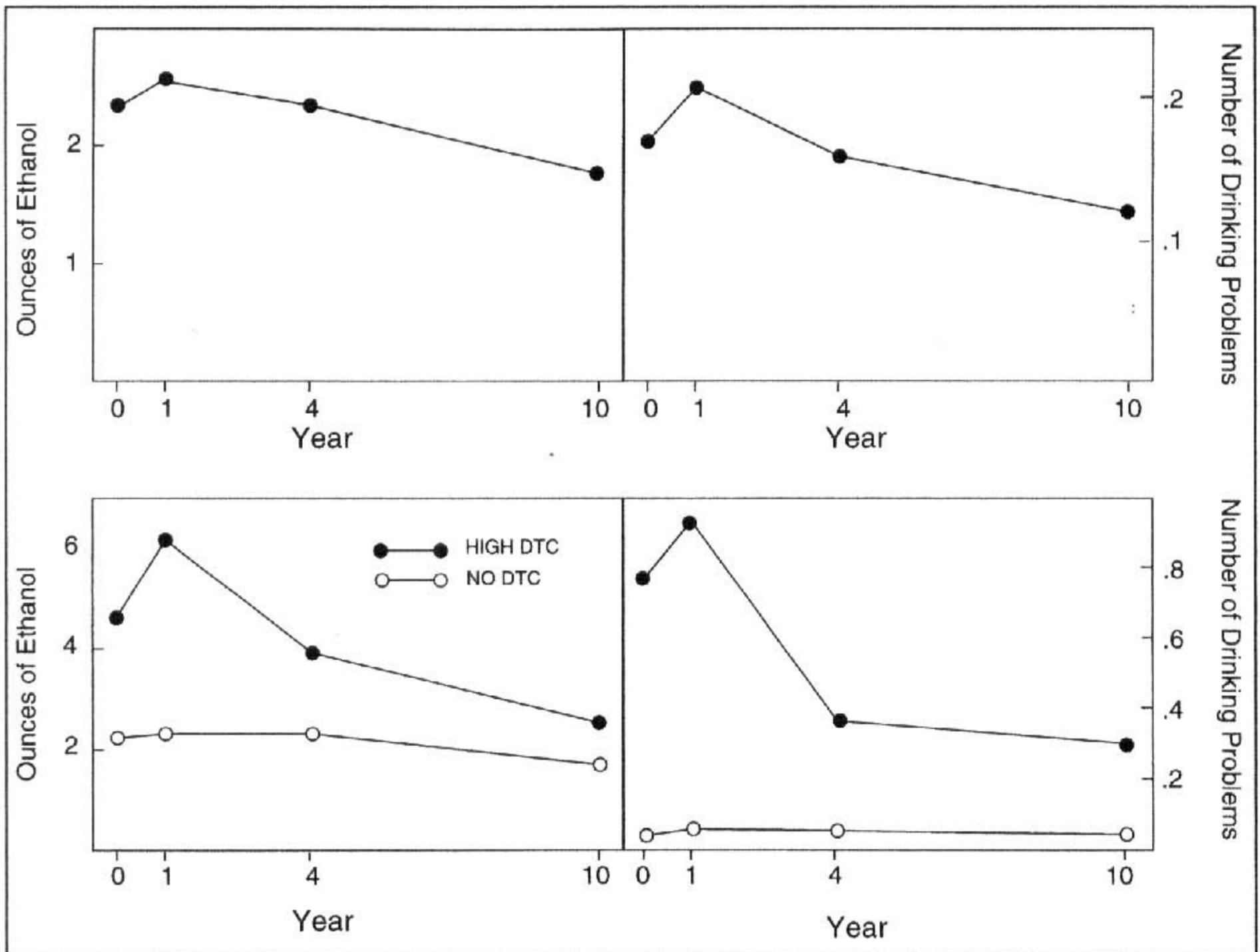


FIGURE 1. Mean alcohol consumption and drinking problems across 10 years for the full sample (top panels) and as a function of drinking to cope (DTC) at baseline (bottom panels)

comes relationship (the n for this set of analyses is 421). Baseline drinking to cope was significantly associated with the relationship between time and both alcohol consumption ($\gamma = 0.50$, $t = 3.38$, $p < .01$) and drinking problems ($\gamma = 0.073$, $t = 1.99$, $p < .05$) during the subsequent year. Thus, not only did drinking to cope relate to greater alcohol consumption and more drinking problems at baseline as noted above, but the more prone individuals were to drink to cope at baseline the greater increase they showed on both drinking outcomes in the following year.

Drinking to cope as a time-varying covariate. There was a considerable amount of change in individuals' propensities to drink to cope over the 10-year interval. For example, many individuals who reported high levels of drinking to cope at baseline (scores of 2 or more) did not report such high levels at the 10-year follow-up. In part, this temporal decline in drinking to cope is associated with aging. At baseline, older respondents were less likely to drink to cope ($r = -0.11$, $p < .05$) and consumed less alcohol ($r = -0.22$, $p < .01$). In addition, some of the temporal variability in drinking to cope is due to assessing coping responses in the context of specific stressors that vary over time.

These observations suggested the importance of examining the association between changes in drinking to cope and drinking outcomes. Thus, we also examined a Level 1 model that included drinking to cope as a time-varying covariate across all four observations (the n for this set of analyses is 421). Controlling for the effect of time, drinking to cope as a time-varying covariate made a unique significant contribution to predicting both alcohol consumption ($\beta = 1.38$, $t = 11.90$, $p < .01$) and drinking problems ($\beta = 0.32$, $t = 15.26$, $p < .01$). Over the 10-year interval, independent of the effect of time, increases in drinking to cope were linked to increases in drinking behavior and decreases in drinking to cope were linked to decreases in drinking behavior.

Drinking to cope, emotional distress and drinking behavior

Depressive symptoms and drinking behavior. We ran Level 1 models with the full sample to describe the overall relationship between depressive symptoms and each index of drinking behavior across the four observations (the n for this set of analyses is 391). Depressive symptoms were significantly associated with drinking problems ($\beta = 0.006$, $t = 4.41$, $p < .01$), but not with alcohol consumption ($\beta = 0.01$, $t = 0.93$, NS). However, there was significant variability ($\chi^2 = 479.10$, 390 df, $p < .01$) among the individual slopes describing the relationship between depressive symptoms and alcohol consumption.

We then examined the role of drinking to cope in strengthening the link between depressive symptoms and drinking behavior. We used depressive symptoms at Level 1 to predict drinking outcomes across the four observa-

tions, with drinking to cope at baseline as a Level 2 predictor. Baseline drinking to cope significantly strengthened the relationship between depressive symptoms and both alcohol consumption ($\gamma = 0.03$, $t = 2.74$, $p < .01$) and drinking problems ($\gamma = 0.007$, $t = 4.26$, $p < .01$). Individuals who were more prone to drink to cope at baseline showed a stronger overall link between depressive symptoms and both drinking outcomes. As an illustration, the relationship between depressive symptoms and drinking behavior across the four observations is shown as a function of contrasting levels (scores of 0 vs 2 or more) of drinking to cope at baseline (top two panels of Figure 2); individuals with drinking to cope scores of 1 fit an intermediate pattern.

Anxiety and drinking behavior. Next, we ran Level 1 models with the full sample to describe the overall relationship between anxiety and each index of drinking behavior across the four observations (the n for this set of analyses is 252). Anxiety was significantly associated with both alcohol consumption ($\beta = 0.21$, $t = 2.11$, $p < .05$) and drinking problems ($\beta = 0.063$, $t = 3.29$, $p < .01$).

We then examined the role of drinking to cope in strengthening the link between anxiety and drinking behavior. We used anxiety at Level 1 to predict drinking outcomes across the four observations, with drinking to cope at baseline as a Level 2 predictor. Baseline drinking to cope significantly strengthened the relationship between anxiety and both alcohol consumption ($\gamma = 0.31$, $t = 2.69$, $p < .01$) and drinking problems ($\gamma = 0.11$, $t = 5.86$, $p < .01$). The more prone individuals were to drink to cope at baseline, the stronger the overall link they showed between anxiety and both drinking outcomes. As an illustration, the relationship between anxiety and drinking behavior across the four observations is shown as a function of contrasting levels (scores of 0 vs 2 or more) of drinking to cope at baseline (bottom two panels of Figure 2); individuals with drinking to cope scores of 1 fit an intermediate pattern.

Gender and age as covariates. At baseline, women reported more anxiety than did men ($t = -2.48$, 422 df, $p < .05$) and men consumed more alcohol than did women ($t = 4.14$, 414 df, $p < .01$). Also at baseline (as noted previously), older individuals consumed less alcohol. Thus, we repeated the HLM analyses on drinking to cope, emotional distress and drinking behavior, controlling for age and gender (the n 's are 391 and 252, respectively, for the analyses with depressive symptoms and anxiety).

Controlling for gender and the Drinking to Cope \times Gender interaction, the role of drinking to cope in strengthening the link between emotional distress and drinking behavior remained significant ($p < .01$) for both depressive symptoms and anxiety symptoms in predicting both drinking outcomes. In addition, controlling for age and the Drinking to Cope \times Age interaction, the role of drinking to cope in strengthening the link between emotional distress and drinking behavior remained significant ($p < .01$) for both

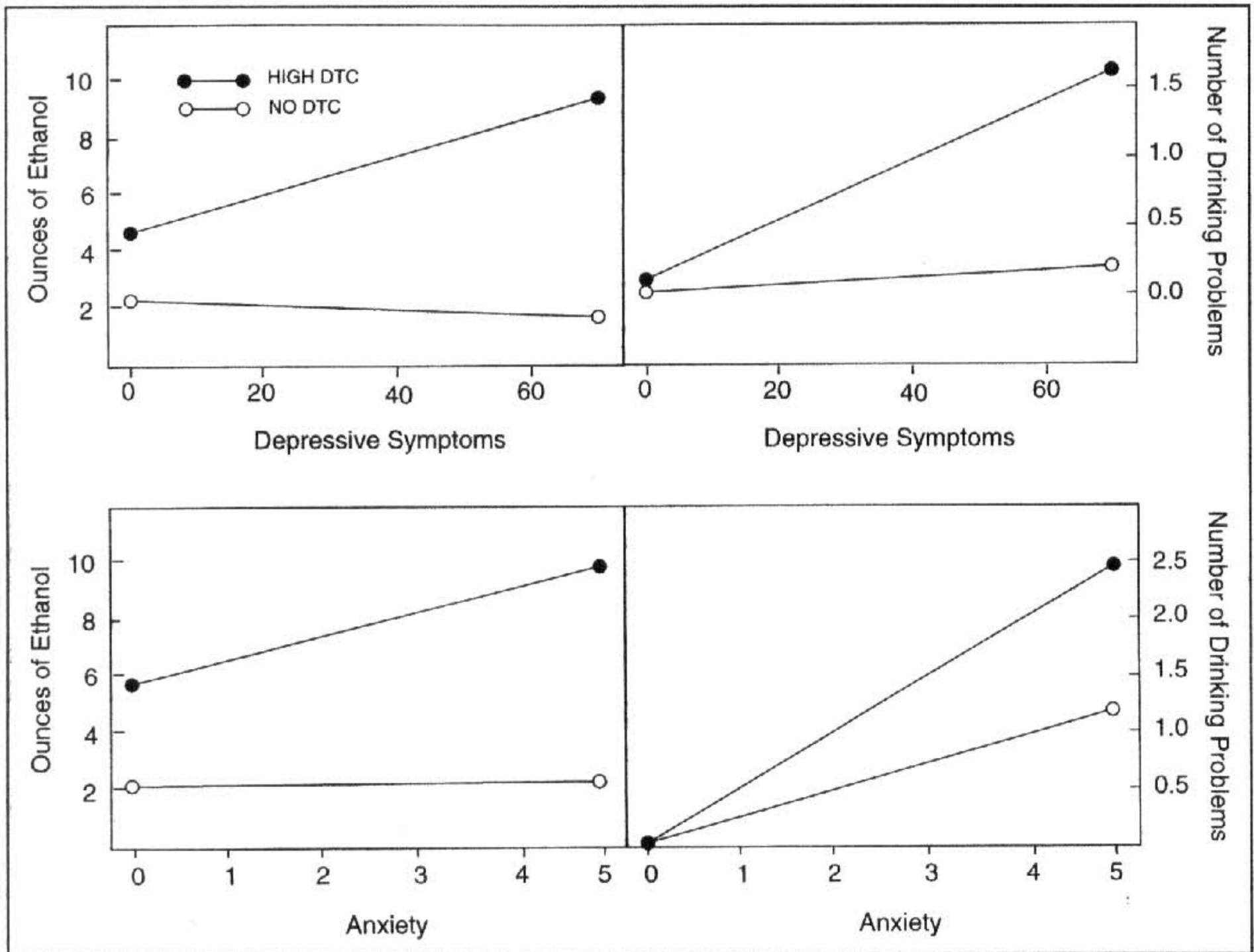


FIGURE 2. Depressive symptoms-drinking behavior relationships (top panels) and anxiety-drinking behavior relationships (bottom panels) as a function of drinking to cope (DTC) at baseline

depressive symptoms and anxiety symptoms in predicting both drinking outcomes. The finding that drinking to cope strengthened the link between anxiety and drinking behavior was stronger for men than for women (*t* tests, *p* < .05) with both outcomes.

Discussion

Using a baseline sample of over 400 adults followed over a 10-year period, we have examined the role of drinking to cope in predicting drinking behavior both directly and as a moderator of the emotional distress-drinking behavior relationship. Findings strongly supported our hypotheses. Initial drinking to cope predicted alcohol consumption and problem drinking across the ensuing 10-year period. In addition, initial drinking to cope strengthened the link between emotional distress and drinking behavior.

Extending previous cross-sectional research (Abbey et al., 1993; Grunberg et al., 1999; Martin et al., 1992), drink-

ing to cope at baseline was associated with more alcohol consumption and drinking problems at all four observations across the 10-year period. Initial drinking to cope was also predictive of increases in both alcohol consumption and drinking problems in the following year. Thus, within a 1-year interval, drinking to cope operates prospectively as a risk factor for increased alcohol use and abuse. In addition, change in drinking to cope was positively associated with changes in both alcohol consumption and drinking problems over the 10-year interval. Thus, over a longer interval, as the propensity to rely on alcohol to cope fluctuates, both alcohol use and abuse vary in a corresponding way—increases in drinking to cope are linked to increases in drinking behavior and decreases in drinking to cope are linked to decreases in drinking behavior.

Consistent with other research (Peirce et al., 2000; Schutte et al., 1997), we did not find a simple relationship between depression and alcohol use. However, congruent with previous cross-sectional research on alcohol expectan-

cies and depressed mood (Johnson and Gurin, 1994), we found that the more prone individuals were to drink to cope at baseline, the stronger the link they showed between depressive symptoms and both drinking outcomes across the 10-year interval. Also, consistent with previous cross-sectional research on alcohol expectancies and anxiety (Kushner et al., 1994), we demonstrated that initial drinking to cope strengthened the association between anxiety and both drinking outcomes across the 10-year period. The role of drinking to cope in strengthening the link between anxiety and drinking behavior was stronger for men than for women, which is consistent with previous findings (Kushner et al., 1994). This finding may reflect social norms that make drinking behavior less acceptable for women compared with men (Gomberg, 1993).

The principal reinforcing effect of alcohol is presumed to be relief from emotional distress (Maisto et al., 1999). For individuals with inadequate general coping skills, alcohol's mood-altering properties may offer an enticing antidote for dysphoric affect (Cooper et al., 1988). For example, in reviewing the social learning model of alcohol use, Maisto et al. (1999) concluded that social learning theory is a coping deficits model; the use of alcohol in stressful situations increases when alternative coping behaviors are not available to the individual. The present findings are directly applicable to stress and coping models (see Peyser, 1993; Wills and Hirky, 1996) of alcohol use. They demonstrate the power of alcohol-related coping strategies in predicting long-term drinking behavior and they illustrate one way in which such coping is linked to alcohol use and abuse.

These results are also relevant to alcohol expectancy theory (see Goldman et al., 1999). After two decades of evidence that alcohol expectancies predict drinking behavior, investigators have turned toward developing a fuller understanding of the processes through which the expectancy-alcohol link operates (Stein et al., 2000). Drinking to cope may play an important role in this linkage; cross-sectional evidence with both adults (Cooper et al., 1988) and adolescents (Laurent et al., 1997) suggests that drinking to cope may mediate the link between alcohol expectancies and drinking outcomes.

More broadly, the present focus on coping strategies underscores the importance of considering individual differences in emotion-based theories of drinking behavior. Both the tension reduction (Greeley and Oei, 1999) and affect models (Lang et al., 1999) of alcohol use need to be broadened to incorporate individual differences in alcohol use and response. In reviewing the tension reduction hypothesis of alcohol use, for example, Greeley and Oei (1999) noted that some individuals use alcohol in response to stress, whereas others do not. They suggested that individual differences in coping strategies augment or attenuate stress-induced drinking.

Self-report measures are subject to both social desirability and common method variance. Future research is needed to extend our findings to include objective indexes of alcohol consumption and drinking problems (e.g., biological measures or medical and legal records), as well as to include corroborating reports of drinking-related functioning from collaterals (e.g., spouses). In addition, future research would be strengthened by assessing drinking to cope with a broader index than the single tension reduction item used here (see Cooper et al., 1988).

Future research would also be strengthened by including measures of coping dispositions as well as of specific coping responses. Indexing coping dispositions would help to reduce some of the variability in coping over time and would permit analyses of the role of ongoing coping deficits in predicting drinking to cope in particular drinking situations. Broader predictive frameworks are also needed to examine personal and environmental factors associated with the development of drinking to cope and to examine the role of drinking to cope in mediating between such factors and drinking outcomes.

Emerging evidence suggests that the use of alcohol to cope with negative affect operates as a risk factor for developing alcohol use disorders (Carpenter and Hasin, 1999). The strength of the present findings across a 10-year interval underscores the potential value of: (1) identifying coping-based risk factors for developing alcohol use disorders; (2) using a brief screen in primary care settings to identify high-risk individuals with whom alcohol is likely to be used as a coping response; and (3) developing coping-based interventions offering a flexible repertoire of alternative coping skills as key components of stress management, preventive education and alcohol treatment programs (Cooper et al., 1988; Gomberg, 1993; Miller and Brown, 1997).

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