Coping with Causal Uncertainty through Alcohol Use

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Abstract

Objective: We examined whether individuals use alcohol in order to cope with causal uncertainty (i.e., doubt about the causes of events). We predicted that higher levels of causal uncertainty would be associated with stronger coping motives, which, in turn, would predict more problems with alcohol. We also examined age as a moderator, with the expectation that stronger associations would be found among younger adults. **Method:** Two hundred sixty-three adults who drank alcohol at least occasionally completed questionnaires assessing causal uncertainty, correlates of causal uncertainty, motives for drinking, alcohol consumption, and alcohol-related problems. **Results:** Moderated mediation analyses revealed that among younger adults, causal uncertainty had a significant indirect effect on problems with alcohol through coping with depression and enhancement motives. Among older adults, there were no significant associations between causal uncertainty and alcohol motives or problems. The effect via the coping with depression motive held even after controlling for alcohol consumption and the major cognitive and affective correlates of causal uncertainty, whereas the effect via the enhancement motive became nonsignificant. **Conclusions:** Our results are consistent with the idea that younger adults use alcohol to cope with causal uncertainty, putting them at greater risk for alcohol-related problems.

Keywords: causal uncertainty; coping; alcohol use; drinking motives; alcohol-related problems

1. Introduction

"Booze may not be the answer, but it helps you to forget the question." - Lt. Henry Mon, USAF, circa 1961

Causal uncertainty refers to doubt about one's ability to understand the causes of events in the social world (Weary & Edwards, 1994; 1996; Weary, Tobin & Edwards, 2010). For example, people who are high in causal uncertainty might feel uncertain when they think about why a marriage ended in divorce or why a work colleague is so successful. According to the causal uncertainty model (Weary & Edwards, 1996; Weary et al., 2010), when one's current level of causal uncertainty exceeds one's desired level by a noticeable amount, people experience negative affect and are motivated to reduce the discrepancy. After assessing the chances of successful uncertainty reduction, individuals may adopt a goal of accurate understanding and pursue this by carefully gathering and processing relevant information (Tobin & Weary, 2008). However, when the discrepancy between one's current and desired level of causal uncertainty is large, attempts to reduce causal uncertainty may be seen as too costly or unlikely to succeed. In this case, individuals should attempt to disengage from the goal of accurate understanding. More generally, in the context of stress, causal uncertainty is associated with disengaged coping (Chang, 2000). There is also evidence that the initial response to causal uncertainty involves inhibition of uncertainty-related thoughts (Wichman, Brunner, & Weary, 2008). Further, causal uncertainty both stems from and contributes to a lack of perceived control (Edwards & Weary, 1998). Higher levels of causal uncertainty are associated with higher levels of depression and anxiety (Weary & Edwards, 1994), and unless buffered by a sense of secondary control (i.e., acceptance of and adjustment to existing events), lead to increases in negative affect (Tobin & Raymundo, 2010). In this study, we examine causal uncertainty in the context of problem drinking.

1.1 Causal Uncertainty and Alcohol Use

Alcohol may be attractive to people with high causal uncertainty because it can reduce self-awareness. Reduced self-awareness alleviates negative affect by reducing the extent to which information is encoded in self-relevant terms and evaluation of oneself according to internal standards (Hull, 1981). Such reduction in self-awareness would also serve to reduce the salience of the discrepancies between one's current and desired levels of understanding, thereby reducing negative affect for those high in causal uncertainty. Consuming alcohol has also been found to narrow the focus of one's attention (Giancola, Josephs, Parrott, & Duke, 2010). Narrowed attention can reduce negative affect if one focuses on an alternate activity (e.g., watching television; Steele & Josephs, 1990). Applied to causal uncertainty, narrowed attention may prevent people from engaging in an effortful causal analysis, thereby facilitating disengagement. Thus, we would expect higher levels of causal uncertainty to be associated with stronger motives to drink in order to cope with negative thoughts and feelings.

1.2 Drinking Motives

Motives for drinking have been extensively examined and have been conceptualized as a proximal pathway to alcohol use (Kuntsche, Knibbe, Gmel, & Engels, 2005). Cooper, Frone, Russell, and Mudar (1995) have argued that people who depend on alcohol to cope with their negative affect (i.e., coping motives) feel the need to drink alcohol even when drinking has negative outcomes. Controlling for the amount of alcohol people consumed, stronger coping motives have been associated with more alcohol-related problems. In contrast, people who drink to enhance positive affect (i.e., enhancement motives) are thought to have more control over their drinking. Cooper et al. (1995) found enhancement motives were associated with more alcohol-related problems, but only to the extent that enhancement motives were associated with increased alcohol consumption. Recent studies also find

coping, enhancement, and social motives (drinking to be more comfortable in social situations) to be associated with alcohol consumption and related problems (Hasking, Lyvers & Carlopio, 2011).

Drinking motives change with age. In an adult sample from the general population (mean age = 42), Cooper et al. (1995) found older participants held lower coping and enhancement motives for drinking, drank less, and experienced fewer alcohol-related problems than younger participants. Although there are notable exceptions (e.g., those who develop alcohol use disorders), it is possible that as people age, they learn that alcohol serves as a temporary solution to negative affect that can exacerbate their problems. Additionally, with increasing work and family responsibilities as people age, there are fewer opportunities to drink at hazardous levels.

1.3 The Current Research

The main goal of the current research was to investigate causal uncertainty as a potential risk factor for alcohol-related problems. This possibility has not yet been examined in either the causal uncertainty or addiction literature. However, related constructs such as social anxiety, depression, and rumination have been found to be associated with alcohol-related problems (Cooper et al., 1995; Lewis et al., 2008; Skitch & Abela, 2008). Broadly, we hypothesized that causally uncertain individuals would have stronger coping motives for drinking, and in turn, experience more alcohol-related problems. We further examined age as a moderator of this effect. Based on Cooper et al.'s finding of a decrease in drinking motives and problems as individuals age, we hypothesized that positive associations between causal uncertainty, coping motives, and alcohol-related problems would be stronger in younger adults. We also assessed known correlates of causal uncertainty/drinking problems (i.e., depression, anxiety, stress, rumination, perceived control and causal importance), to establish

that causal uncertainty was a unique predictor of alcohol motives and alcohol-related problems.

2. Method

2.1 Participants

This project was approved by the School of Psychology's Ethics Review Board. Three hundred and eight individuals (118 male, 190 female) completed the study through Amazon's Mechanical Turk website, a place where registered workers complete a variety of tasks for small amounts of money (Buhrmester, Kwang, & Gosling, 2011). We used the first item on the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de al Fuente, & Grant, 1993) as a screening item to identify people who consumed alcohol at least on an occasional basis. After excluding 45 participants who indicated that they never have a drink containing alcohol, our sample consisted of 263 current drinkers (98 male, 165 female), with the majority (69%) drinking at least 2-4 times a month. Participants' age ranged from 18 to 70 (M = 32.41, SD = 11.29) and ethnicity was predominately Caucasian (83% Caucasian, 8% African American, 10% Other). Participants were paid $0.75 each, a typical payment for a questionnaire of this length on Mechanical Turk.

2.2 Procedure

Participants followed a link to a Qualtrics survey that contained 10 questionnaires. The questionnaires were organized into two blocks: the questionnaires that were not related to alcohol came first, followed by the alcohol-related questionnaires. Within each block, the questionnaires were randomized. Prior to completing the questionnaires, all participants read an informed consent document and agreed to participate in the study.

2.3 Measures

2.3.1 Causal Uncertainty Scale (CUS). The CUS contains 14 items that express uncertainty about the causes of positive and negative events involving the self and others

(Weary & Edwards, 1994). Participants rated the extent to which they agreed with each item on 6-point scales (1 = *strongly disagree*, 6 = *strongly agree*). The CUS was validated on university students and contained three items that referred to academic outcomes (e.g., "When I receive good grades, I usually do not understand why I did so well"). We modified these items to refer to outcomes in general (e.g.," When I receive good outcomes, I usually do not understand why I did so well").

2.3.2 Modified Drinking Motives Questionnaire - Revised (DMQ-R). The 28-item DMQ-R assesses five motives for drinking (Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007). Participants indicated how often they drink for each reason on 5-point scales (1 = *almost never/never*, 5 = *almost always/always*), taking into consideration all the times they drink. The five motives assessed are coping with depression (e.g., "To forget my worries), coping with anxiety (e.g., "To relax"), enhancement (e.g., "Because I like the feeling"), conformity (e.g., "To be liked"), and social (e.g., "As a way to celebrate").

2.3.3 Rutgers Alcohol Problems Index (RAPI). The 23-item RAPI assesses problems due to drinking alcohol (White & Labouvie, 1989). Participants indicated how many times during the last three months each outcome had happened to them while they were drinking or because of their alcohol use (0 = *never*, 4 = *more than 10 times*). Sample items include "Had a fight, argument or bad feelings with a family member," and "Felt that you had a problem with alcohol."

2.3.4 Quantity Frequency Peak Use Index (QFP). The 5-item QFP assesses alcohol consumption (Baer, 1993). Participants are asked a) about the occasion they drank the most in the past month and b) on a given weekend evening in the past month, how much they drank (1 = *0 drinks*, 26 = *25+ drinks*) and how many hours they spent drinking (1 = *0-1*, 11 = *10+*). They were also asked how many days of the week they drank alcohol during the

past month (1 = *I did not drink at all*, 12 = *every day*). Because these items were on different scales, they were standardized prior to computing an overall score.

2.3.5 Depression Anxiety Stress Scales, Short version (DASS-21). The 21-item DASS (Lovibond & Lovibond, 1995) was used to assess depression (e.g., "I felt down-hearted and blue"), anxiety (e.g., "I felt I was close to panic), and stress (e.g., "I found it hard to wind down"). Participants rated the extent to which each statement applied to them over the past week.

2.3.6 Realistic Control Scale (RCS). The 21-item RCS (Zuckerman, Knee, Kieffer, & Gagne, 2004) assesses the extent to which participants perceive a sense of *primary* control over controllable events (e.g., "Hard work and following through are the best means of realizing one's goals").

2.3.7 Secondary Control Folk Beliefs (SCFB). The 5-item SCFB scale assesses *secondary* control, or an acceptance of and adjustment to existing events (Chipperfield et al., 2012; e.g., "Negative experiences can often be a blessing in disguise").

2.3.8 Ruminative Responses Scale (RRS). The 22-item RSS assesses facets of rumination by asking participants to indicate on 4-point scales what they generally do when they are upset (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). We used the 5-item brooding subscale, which is thought to be the more problematic form of rumination (e.g., Think "What am I doing to deserve this?") and the 5-item reflection subscale, which is thought to be less problematic (e.g., "Analyze recent events to try to understand why you are depressed").

2.3.9 Interaction Anxiousness Scale (IAS). The IAS contains 15 items which assess the extent to which participants feel nervous when interacting with people (e.g., "I often feel nervous even in casual get-togethers;" Leary, 1983).

2.3.10 Causal Importance Scale (CIS). The 6-item CIS assesses the extent to which participants value causal understanding (e.g., "I feel like it is important to be able to

determine the actual cause or causes of events in my life;" Tobin & Weary, 2008). The one reverse-scored item lowered the alpha of the scale, so was removed from the calculation of the scale.

3. Results

Overall, there was a very small amount of missing data (< 1% of all possible responses). To accommodate missing values, we averaged ratings rather than summing when we computed scale scores. A small proportion of scores (< 1% of all responses) were outliers (> 3 SD from the mean). To retain these scores but reduce the influence of outlying values on the results, we recoded outlying responses to 3 SD from the mean (Tabachnick & Fidell, 2007). Bivariate correlations and Cronbach's alphas for all measures are shown in Table 1. Higher levels of causal uncertainty were associated with lower levels of control, and with higher levels of depression, anxiety, stress, rumination, social anxiety, depression and anxiety coping motives, conformity motive, and alcohol-related problems. More alcohol-related problems were also associated with higher levels of depression, stress, anxiety, rumination, social anxiety, all motives for drinking, and alcohol consumption, and lower levels of primary control and age.

3.1 Age as a Moderator

Next, we examined age as a potential moderator of the association between causal uncertainty and drinking motives, alcohol consumption, and alcohol-related problems. Age and causal uncertainty were mean-centered. Each of the alcohol variables was then regressed on age, causal uncertainty, and Age X Causal Uncertainty (see Table 2 for regression coefficients). These analyses revealed significant Age X Causal Uncertainty interactions on four of the five motives: coping with depression, coping with anxiety, conformity, and enhancement. The Age X Causal Uncertainty interaction on alcohol-related problems was marginally significant, but it became significant when we controlled for alcohol consumption.

Simple slopes analyses examined the association between causal uncertainty and the drinking variable at 1 SD above (43.59 years) and below the mean (21.18 years) on age. For the younger adults, causal uncertainty was associated with significantly higher levels of the coping with depression motive, coping with anxiety motive, conformity motive, enhancement motive, and alcohol-related problems. Among the older adults, causal uncertainty was not significantly associated with any of the motives or alcohol-related problems.

3.2 Motives as Mediators

Bootstrapping procedures were used to test the moderated mediation model shown in Figure 1. Five thousand bootstrap samples were used to calculate the 95 percent confidence intervals of the indirect effects for the young and older participants, using Hayes' (2013) PROCESS macro, model 8. Confidence intervals that do not contain zero indicate a significant indirect effect via the specific mediator. Analyses revealed a significant indirect effect of the Age X Causal Uncertainty interaction on alcohol-related problems via the coping with depression (effect = -.0022, *SE* = .0010, 95% CI [-.0045, -.0005]) and enhancement motives (effect = -.0014, *SE* = .0007, 95% CI [-.0028, -.0002]). Conditional indirect effects revealed significant indirect effects of causal uncertainty on alcohol-related problems via coping with depression for younger adults (effect = .0530, *SE* = .0199, 95% CI [.0178, .0960]) but not older adults (effect = .0044, *SE* = .0127, 95% CI [-.0210, .0311]). Similarly, the indirect effects of causal uncertainty on alcohol-related problems via enhancement was significant for younger (effect = .0201, *SE* = .0086, 95% CI [.0051, .0384]), but not older adults (effect = -.0106, *SE* = .0101, 95% CI [-.0325, .0079]). The direct effect of the Age X Causal Uncertainty interaction on alcohol-related problems was not significant with the mediators in the model, B = -.0002, $t(255) = 0.11$, $p = .91$.

3.2.1 Controlling for the correlates of causal uncertainty and alcohol consumption. Lastly, we conducted an additional analysis in which we limited our

mediators to coping with depression and enhancement motives and added all assessed correlates of causal uncertainty as controls: depression, anxiety, stress, control, rumination, social anxiety, and causal importance. Controlling for these known covariates, we observed a significant indirect effect of the Age X Causal Uncertainty interaction on alcohol-related problems via the coping with depression motive (effect = -.0010, *SE* = .0006, 95% CI [-.0024, -.0001]) but not the enhancement motive (effect = -.0012, *SE* = .0007, 95% CI [-.0027, .0001]).

This pattern of results held when controlling for alcohol consumption, either with or without including the correlates of causal uncertainty. We obtained a significant indirect effect though the coping with depression motive (effect with causal uncertainty correlates = -.0012, *SE* = .0006, 95% CI [-.0026, -.0002]; effect without causal uncertainty correlates = -.0029, *SE* = .0011, 95% CI [-.0054, -.0011]) and a non-significant effect through the enhancement motive (effect with causal uncertainty correlates = -.0006, *SE* = .0005, 95% CI [-.0016, .0002]; effect without causal uncertainty correlates = -.0006, *SE* = .0005, 95% CI [-.0017, .0002]).

4. Discussion

4.1 Summary of Results

The current study revealed that among younger adults, causal uncertainty was associated with stronger motives to drink in order to cope with depression and anxiety, to conform, and to enhance. Causal uncertainty was also associated with more alcohol-related problems among younger adults. Moderated mediation analyses revealed that the associations between causal uncertainty and alcohol-related problems among younger adults were mediated by both coping with depression and enhancement motives. However, when controlling for alcohol consumption or the correlates of causal uncertainty, the indirect effect via the enhancement motive became non-significant while the indirect effect via the coping

with depression motive remained significant. Thus, it seems that causal uncertainty's association with alcohol-related problems is best explained by the coping with depression motive.

4.2 Motives for Drinking

Consistent with past research, we found that a stronger coping motive was associated with more alcohol-related problems even when alcohol consumption was included in the model. However, the positive association between the enhancement motive and alcohol-related problems was due to greater alcohol consumption (Cooper et al., 1995). Coping with depression, but not coping with anxiety, emerged as a significant mediator. This may be due to the inclusion of more cognitive items in the coping with depression scale. Conceptually, it should be the effects of alcohol on thoughts that allow causally uncertain people to feel better. That is, alcohol should help them disengage from futile attempts to improve their understanding, which would otherwise create negative affect (Tobin & Raymundo, 2010; Weary et al., 2010).

We should note that although Cooper et al. (1995) found that a broad coping motive predicted more alcohol related problems above and beyond alcohol consumption, Grant et al. (2007) found that the coping with depression motive only predicted increases in alcohol-related problems over time when alcohol consumption was *not* included in the model. Thus, alcohol consumption might play a role in the indirect effect of causal uncertainty on increases in alcohol-related problems via the coping with depression motive. However, this would need to be tested with a longitudinal design.

4.3 Causal Uncertainty and Age

Our results contribute to the existing knowledge about drinking motives and alcohol-related problems over the lifespan. Cooper et al. (1995) found that among adults, older age was associated with lower coping and enhancement motives, less alcohol consumption, and

fewer alcohol-related problems. We observed similar associations in our sample, with older adults having lower coping with depression, enhancement, and social motives, less alcohol consumption, and fewer alcohol-related problems. Of greater interest, we found that older adults appeared to cope differently with causal uncertainty. Whereas younger adults were more likely to hold coping with depression motives for drinking when they were high in causal uncertainty, older adults were not. This could be the result of older adults holding more negative expectancies about the effects of alcohol (Cooper et al., 1995). It could also be due to people mastering developmental tasks as they get older (Demb & Campbell, 2009) and developing better emotion regulation skills (Shiota & Levenson, 2009). The present findings provide a novel contribution to the broader literature suggesting alcohol as a means of responding to uncertainty.

That people cope differently with causal uncertainty as a function of age has not yet been examined in the literature, with the bulk of research using university students (Weary et al., 2010). This research has mainly focused on increased information processing as a response to causal uncertainty, although one study found evidence for disengagement among causally uncertain students in the face of stress (Chang, 2000). Future research should further examine responses to causal uncertainty and how these might change across the lifespan.

4.4 Conclusions

The main contribution of the current research is the identification of causal uncertainty as a unique predictor of drinking motives and alcohol-related problems among young people. Causal uncertainty was found to predict more alcohol-related problems via the coping with depression motive. This effect remained significant even after controlling for alcohol consumption and the main affective and cognitive correlates of causal uncertainty. Thus, the effect was not simply due to higher levels of negative mood, lower levels of perceived control, or to a general tendency to ruminate. Instead, it seems there is something

unique about not understanding why events occur that can potentially create a greater risk for alcohol-related problems. Due to the cross-sectional nature of our study, we need to be careful about drawing causal conclusions. It is possible, for instance, that uncontrollable negative outcomes associated with alcohol use could contribute to causal uncertainty. However, there is no reason to expect that this pathway would be moderated by age. Additionally, we should note that among younger adults, the size of the association between causal uncertainty and alcohol-related problems was only moderate. It is also possible that the size of the association may vary in different samples. However, our results are consistent with the idea that causal uncertainty is a potential risk factor for alcohol-related problems among young adults. Young people with high levels of causal uncertainty may need help developing alternative ways of coping with their uncertainty. Future research could identify how older adults cope with causal uncertainty and examine ways of promoting those strategies.

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Table 1. Correlations among the variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. CU	*.94*																
2. depression	.48**	*.92*															
3. anxiety	.40**	.70**	*.87*														
4. stress	.44**	.74**	.74**	*.88*													
5. PC	-.59**	-.46**	-.43**	-.35**	*.86*												
6. SC	-.17**	-.30**	-.17**	-.10	.34**	*.83*											
7. brooding	.46**	.61**	.56**	.63**	-.33**	-.03	*.86*										
8. reflection	.35**	.45**	.45**	.51**	-.26**	-.03	.63**	*.85*									
9. social anx	.44**	.49**	.40**	.44**	-.56**	-.19**	.46**	.30**	*.92*								
10. CI	.04	.06	.05	.18**	.09	.17**	.30**	.32**	.08	*.89*							
11. coping D	.30**	.56**	.49**	.49**	-.30**	-.12	.48**	.41**	.31**	.13*	*.95*						
12. coping A	.21**	.37**	.38**	.38**	-.26**	-.02	.35**	.32**	.35**	.20**	.77**	*.79*					
13. enhance	.09	.23**	.19**	.18**	-.05	-.00	.21**	.21**	.03	.13*	.61**	.64**	*.85*				
14. conform	.24**	.36**	.43**	.32**	-.34**	-.10	.35**	.34**	.25**	.06	.46**	.45**	.30**	*.90*			
15. social	-.03	.03	.07	.04	.10	.15*	.16**	.18**	-.01	.22**	.27**	.46**	.51**	.36**	*.81*		
16. problems	.22**	.38**	.37**	.33**	-.27**	-.04	.31**	.32**	.18**	.12	.50**	.43**	.44**	.40**	.22**	*.95*	
17. QFP	.08	.06	.05	.04	.02	.05	-.01	.03	-.03	-.01	.22**	.28**	.46**	.03	.28**	.39**	*.90*
18. age	-.07	-.16*	-.18**	-.20**	.00	.19**	-.18**	-.17**	-.07	-.11	-.14*	-.12	-.19**	-.06	-.12*	-.16**	-.15*

Notes. ** indicates $p < .01$, * indicates $p < .05$. Cronbach's alphas are given in the diagonal.

CU = causal uncertainty, PC = primary control, SC = secondary control, social anx = social anxiety, CI = causal importance, coping D = coping with depression motive, coping A = coping with anxiety motive, enhance = enhancement motive, conform = conformity motive, social = social motive, problems = alcohol-related problems, QFP = quantity, frequency, peak alcohol consumption.

Table 2. Regression of alcohol-related variables on causal uncertainty and age.

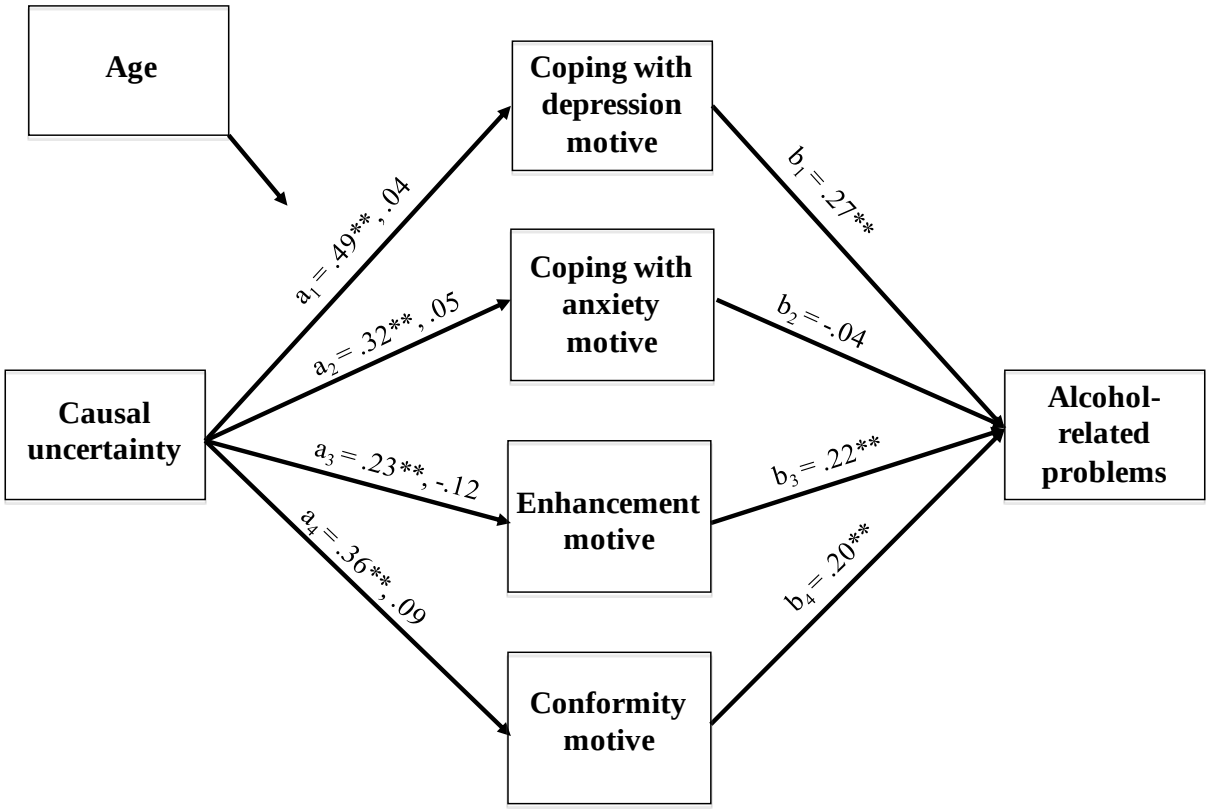
	Coping D	Coping A	enhance	conform	social	QFP	problems	problems (controlling for QFP)
CU	.27**	.19**	.05	.23**	-.04	.07	.20**	.17**
Age	-.13*	-.11	-.19**	-.05	-.13*	-.15*	-.15*	-.10
Age X CU	-.20**	-.12*	-.16*	-.12*	-.04	.04	-.12	-.13*
QFP								.37**
Simple slope of CU								
Younger adults	.49**	.32**	.23**	.36**				.32**
Older adults	.04	.05	-.12	.09				.03

Note. Standardized regression coefficients are reported above. ** indicates $p < .01$, * indicates $p < .05$.

CU = causal uncertainty, coping D = coping with depression motive, coping A = coping with anxiety motive, enhance = enhancement motive, conform = conformity motive, social = social motive, QFP = quantity, frequency, peak alcohol consumption, problems = alcohol-related problems.

Figure Caption

Figure 1. Age as a moderator, and motives for drinking as mediators, of the association between causal uncertainty and alcohol-related problems.



Notes: All values are standardized regression coefficients. The first number listed for each 'a' path is the effect of causal uncertainty on motives at 1 SD below the mean on age (younger adults); the second number is the effect at 1 SD above the mean on age (older adults). The 'b' paths represent the associations between motives and alcohol-related problems, controlling for age and causal uncertainty. ** indicates $p < .01$, * indicates $p < .05$.