Coping-Motivated Escalations in Adolescent Alcohol Problems Following Early Adversity

Michelle J. Zaso[1], **Jennifer P. Read**[2], **Craig R. Colder**[2]

[1]Clinical and Research Institute on Addictions, University at Buffalo – The State University of New York, Buffalo, New York, USA

[2]Department of Psychology, University at Buffalo – The State University of New York, Buffalo, New York, USA

Abstract

Objective: The current study examined whether early stressful events precipitate drinking risks across adolescence and whether coping-motivated drinking mediates such relations.

Method: Families comprised 387 adolescents (55% female, 83% White) recruited for a longitudinal study. Caregivers reported on adolescents' experience of potentially stressful events, including conflict (i.e., disruption of harmonious family relations) and separation (i.e., decreased contact with important persons) events, over the past year when adolescents were approximately 14 years of age. Adolescents reported on their drinking motives, alcohol use, and alcohol problems annually from 18–20 years of age. Growth curve models tested associations of stressful events with latent coping and enhancement/social drinking motives growth factors and subsequent alcohol outcomes.

Results: Most adolescents experienced at least one potentially stressful event. Growth modeling suggested no change in coping motives, but increases in enhancement/social motives over time. Greater conflict events predicted higher frequency of drinking for coping reasons (i.e., coping intercept), which in turn predicted increases in alcohol problems as adolescents began transitioning into young adulthood. Conflict, separation, or total stressful events were not significantly associated with initial level or change in enhancement/social motives, suggesting specificity of mediation by coping-motivated drinking.

Conclusions: Findings support enduring elevations in drinking risk over six years following disruptive family relations in early adolescence. Such risks appear to be driven by negative affect regulation mechanisms through coping-motivated drinking. Future work should assess generalizability of these findings across diverse samples and could test similar negative reinforcement mechanisms of drinking following exposure to clinically impairing traumatic experiences.

Correspondence concerning this article should be addressed to Michelle J. Zaso, Clinical and Research Institute on Addictions, University at Buffalo – The State University of New York, 1021 Main Street, Buffalo, NY 14203-1016. mjzaso@buffalo.edu.

Keywords

Childhood adversity (e.g., abuse and neglect, sexual violence, family conflict, extreme poverty) is associated with a host of serious socioemotional, health, and behavioral repercussions (see Nelson et al., 2020). In particular, relations between adverse childhood experiences (ACEs) and deleterious alcohol outcomes have been demonstrated for decades. The Adverse Childhood Experiences Study provided initial evidence for increased likelihood of alcohol and substance use disorder among individuals with childhood adversity (Felitti et al., 1998). Since this and other early investigations, childhood adversity has demonstrated robust links with a host of alcohol outcomes. Across birth cohorts, twin studies, and nationally representative samples, ACEs have been associated with earlier alcohol use initiation (Dube et al., 2006; Oberleitner et al., 2015; Sartor et al., 2018). Following alcohol emergence, childhood adversity also has been linked to trajectories of heavy episodic drinking across 20 years (Shin et al., 2013) and faster progression to alcohol use disorder (Oberleitner et al., 2015). Consistent with such research, meta-analysis has supported significant associations of childhood adversity with both heavy and problematic drinking across the literature (Hughes et al., 2017). However, despite well-documented associations of childhood adversity with alcohol outcomes, the critical mechanisms underlying these relations remain elusive. Knowledge of such mechanisms could help identify youth at risk for problem drinking as well as inform clinical efforts for exposed youth to help reduce any enduring consequences of early childhood stress on alcohol outcomes.

Early life adversity may confer unique etiological risks for development of problem drinking. Childhood and adolescence encompass the development of stress reactivity and threat appraisal systems (Engel & Gunnar, 2020; Loman & Gunnar, 2010), emotion regulation capabilities (Morris et al., 2007), and beliefs about the role of alcohol in responding to adversity, psychological distress, and affect (Colder et al., 2010; Voogt et al., 2017). Through disruptions in such processes, stressors in early life may elicit lasting impacts on drinking risks once alcohol use emerges in adolescence. Adolescence also presents distinct considerations for emerging alcohol use among youth with a history of adversity. Most drinkers first consume alcohol in adolescence (York et al., 2004), and alcohol use escalates more rapidly across adolescence than in any other developmental stage (Britton et al., 2015). Given the unique developmental processes occurring amid childhood adversity and proximal adolescent alcohol outcomes, researchers have cautioned that prominent models developed mainly to understand drinking in adulthood should not be generalized to adolescence without empirical support (Blumenthal et al., 2008; Cicchetti & Rogosch, 2002). For example, several models suggest stress-related drinking is maintained through negative reinforcement by reductions in emotional distress following drinking. However, such frameworks require repeated, consistent pairings of alcohol use with stress relief that may be more likely within established drinking patterns in adulthood than more varied, opportunistic drinking in adolescence (see Cloutier et al., 2018). Thus, research is

needed to identify mechanisms underlying the specific relations of early life adversity with adolescent alcohol outcomes.

Adolescents' strategies for managing negative emotions that often follow adversity may be crucial to understanding their alcohol outcomes in the aftermath of early life stress. Distress coping models propose that stressors and adversity contribute to distress that then increases alcohol use as a means, albeit largely maladaptive, to cope with negative emotions (Grayson & Nolen-Hoeksema, 2005; Polusny & Follette, 1995). Following early life stressors, children's experience of strong distress, fear, or anxiety also could tax or hinder development of positive, approach-oriented coping strategies. Resulting disruptions in adaptive emotion coping approaches may leave children more vulnerable to negative, avoidance-based coping and maladaptive coping behaviors across later developmental stages (Dvir et al., 2014). Thus, children facing early life adversity may turn to more maladaptive coping strategies later in life, including attempts to cope with emotion through alcohol use once it becomes more readily accessible in adolescence.

Drinking motives have been suggested to be a pathway through which life experiences and emotions affect alcohol use (Cooper et al., 1995; Read et al., 2003), and, as such, coping-motivated drinking may be one mechanism through which early stressful events lead to adverse adolescent alcohol outcomes. Coping motives represent individuals' motivations to drink to reduce or manage negative emotions (Cooper, 1994; Cooper et al., 1995). Following early life stress, adolescents exposed to adversity may develop heightened coping-motivated drinking as they become more likely to turn to alcohol to maladaptively cope with early adversity-related negative emotions. For exposed adolescents, alcohol use may appear to offer psychological respite from strong negative emotionality, help manage daily fluctuations in negative emotion, and/or supplement for more limited adaptive emotion regulation skills (see Schuck & Widom, 2001). Coping-motivated drinking has been demonstrated following a variety of stressors and traumatic experiences (see Hawn, Cusack, et al., 2020), including in longitudinal investigations (Hawn, Bountress, et al., 2020; Lindgren et al., 2012; Miller et al., 2017). Coping-motivated drinking that emerges following adversity further may be especially detrimental for alcohol outcomes. Coping-motivated drinking has been associated with heavy drinking (Cooper et al., 2000) and alcohol problems (Read et al., 2003; Simons et al., 2000), often more so than drinking motivated by social facilitation or enhancement of positive emotion (see Kuntsche et al., 2005). Therefore, coping motives may be a powerful mechanism serving to translate early stressful experiences into risks for adverse adolescent alcohol outcomes.

Research on coping motives as mechanisms of early life stressful events and adolescent alcohol outcomes remains limited. Childhood stressors and trauma have been linked with greater coping motives and alcohol outcomes from early to late adolescence (Hannan et al., 2017; Hogarth et al., 2019; Mezquita et al., 2014; Park et al., 2019; Shin et al., 2020; Topper et al., 2011). However, such research has relied on cross-sectional (Hogarth et al., 2019; Shin et al., 2020) or limited longitudinal designs in which coping motives and alcohol outcomes were assessed concurrently (Hannan et al., 2017; Mezquita et al., 2014; Park et al., 2019; Topper et al., 2011). Temporally ordered designs are needed to help distinguish whether high levels of coping motives are linked to increases in alcohol outcomes over

time following adversity (i.e., mediation), or if coping motives instead arise concurrently with problem drinking that emerges after adversity due to other risk processes. Given that adolescence often comprises emergence and escalation in alcohol use over time (Britton et al., 2015; York et al., 2004), growth in coping motives across this period may be critical to understanding adult alcohol outcomes in the aftermath of early life stress. Coping motives can change dynamically across developmental periods (Littlefield et al., 2010), but to our knowledge, research has not yet tested whether growth in coping motives underlies alcohol outcomes in the aftermath of early life adversity.

Existing research is limited further in its assessment of early adversity, leaving several possibilities unexplored and many questions unanswered. First, extant literature on coping motives in adversity-related adolescent alcohol outcomes has assessed ACEs retrospectively (Hannan et al., 2017; Hogarth et al., 2019; Mezquita et al., 2014; Park et al., 2019; Shin et al., 2020). More proximal assessments of early life stressors could reduce recall bias and permit stronger conclusions about adversity's persisting links with subsequent alcohol outcomes. In addition, it remains unclear from current literature whether specific types of adverse experiences are especially relevant for coping-motivated drinking. Research modeling multiple forms of childhood abuse and neglect together as composite scores has found these stressors to be associated with greater coping-motivated drinking (Park et al., 2019; Shin et al., 2020). However, research on the specific facets of abuse linked to coping motives has been more mixed (Hogarth et al., 2019; Mezquita et al., 2014). Relatedly, the scope of childhood adversities examined thus far has been somewhat narrow, focused largely on abuse or neglect. Examinations across a broader range of adverse childhood experiences, such as witnessing conflict within the family, separation from caregivers, or additional stressful life circumstances, could establish the specific types of adversities linked to coping-motivated drinking development and, thus, may significantly advance efforts to prevent problem drinking.

The current study addresses existing gaps in the knowledge base by examining relations between early adversity and adolescent alcohol outcomes through developmental trajectories of coping-motivated drinking. We utilized a longitudinal sample spanning early to late adolescence and tested whether coping motives mediated associations between stressful events early in life as assessed at approximately 14 years of age with later changes in alcohol use and problems from 18 to 20 years. We hypothesized that early stressful events would be related to stronger coping motives that, in turn, were related to escalations in alcohol use and/or problems across late adolescence.

Methods

Participants and Procedure

Participants were recruited through random digit dialing of households in Erie County, NY from April 2007 to February 2009 for a longitudinal study on adolescent substance use development (for more details, see Colder et al., 2017; Trucco et al., 2014); the study was not preregistered. Erie County was especially well-suited for random digit dialing sampling, because the Census showed it had an extremely high rate of households with telephones (98.5%). Eligible adolescents were 11–12 years of age at the time of recruitment and did

not have any physical or language disabilities that would preclude assessments. Enrolled families were followed annually over nine years. The current analyses used data from Wave 3 (M_{age} = 14.1 years; referred to herein as 14 years for simplicity) when stressful events were assessed as well as Waves 7–9 (M_{age} = 18.4, 19.4, and 20.4 years, respectively; referred to herein as 18, 19, and 20 years for simplicity) when alcohol motives and outcomes were assessed. Wave 3 assessments were conducted in a university research office, and families were compensated $125 for participation. Waves 7–9 assessments were completed online, and participants could choose to come to the university research office to complete the survey. Adolescents were compensated $125 for completion of study questionnaires and laboratory tasks or $50 for completion of questionnaires only. The University at Buffalo Institutional Review Board (IRB) approved all study procedures.

Participants were 387 families comprised of child-caregiver pairs. Adolescents were 55% female at Wave 1 and predominantly non-Hispanic White (83%) or Black (9%). Families had a median annual household income of $70,000 (range = $1,500 – $500,000), and 6% received public income assistance. Most caregivers (58%) completed college or graduate/professional school. Participant demographics were generally comparable to the recruitment setting (see Trucco et al., 2014). Retention was strong across waves (Ns = 350 – 373; 90–96%), and missing data analyses demonstrated no significant differences in participants lost to follow-up across the study (see Colder et al., 2017). For study waves used in the present analyses, adolescents who were lost to follow-up before Wave 3 (n = 17) did not differ significantly from those who completed the Wave 3 assessment on sex ($\chi^2[1]$ = 0.10, p = .75), non-Hispanic White race status ($\chi^2[1]$ = 0.57, p = .45), age ($t[16.92]$ = −0.07, p = .47), or lifetime alcohol use at Wave 1 ($\chi^2[1]$ = 0.72, p = .40). Further, adolescents who were lost to follow-up between Waves 3 and 7 (n = 24) did not differ significantly from those who completed the Wave 7 assessment on sex ($\chi^2[1]$ = 1.81, p = .18), non-Hispanic White race status ($\chi^2[1]$ = 1.11, p = .29), age ($t[368]$ = −1.25, p = .11), or lifetime alcohol use at Wave 3 ($\chi^2[1]$ = 0.68, p = .41).

Measures

Early Stressful Events—During the Wave 3 assessment, caregivers reported on their adolescent's experience of stressful events over the past 12 months using items adapted from the General Life Events Schedule for Children (GLESC; Sandler et al., 1986, August). Caregivers reported on their adolescent's experience and perceived impact of 27 stressful events using a 0 (*did not happen*) to 3 (*happened; it was very upsetting*) scale. Four scores were computed for analyses. Total events represented a sum of all 27, dichotomized items capturing the total number of stressful events experienced. Conflict events represented a sum of eight items comprising disruption of harmonious family relations (e.g., "People in your child's family hit each other;" Sandler et al., 1992). Separation events represented a sum of four items capturing decreased contact with important persons (e.g., "You or your child's other parent was arrested or sent to jail;" Sandler et al., 1992). Degree of upset represented a sum of all 27, non-dichotomized items capturing overall perceived impact of stressful events. The GLESC has been noted as a well-established measure of child stressful events (Grant et al., 2004), and parent reports have been correlated with child adjustment (e.g., Lengua et al., 2007).

Adolescent Drinking Motives—During the Waves 7–9 assessments, adolescents reported on their motivations to drink alcohol using the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994). Adolescents reported on their coping (e.g., "Because it helps you when you feel depressed or nervous"), enhancement (e.g., "Because you like the feeling"), and social (e.g., "Because it makes social gatherings more fun") motivations for drinking using a 1 (*almost never/never*) to 5 (*almost always/always*) scale. The conformity motives subscale was excluded from analyses, because conformity motives have demonstrated more mixed associations with adolescent alcohol outcomes (Smit et al., 2020). Coping motives subscales across the three assessments (α = .81, .77, and .79, respectively) were of primary interest for study hypotheses about negative reinforcement drinking following stressful events. Enhancement and social motives were included to control for potential positive affect motivations to drink, given intercorrelations among the drinking motives subscales (Cooper, 1994; Lac & Donaldson, 2017). Enhancement (α = .89, .88, and .87) and social (α = .89, .86, and .87) motives subscales were averaged to create composite enhancement/social motives scores within waves due to high time-specific correlations of enhancement and social motives (rs = .71 – .79, ps < .001). The DMQ-R has been validated within adolescents in relation to alcohol use and problem drinking (Cooper, 1994).

Adolescent Alcohol Use—During the Waves 7 and 9 assessments, adolescents reported on their alcohol use during a typical week using a daily calendar (Collins et al., 1985). Specifically, adolescents reported the number of standard drinks consumed on each day of a typical week from the past 90 days. Sum scores at the Wave 7 and 9 assessments were calculated, representing total number of drinks consumed in a typical week.

Adolescent Alcohol Problems—During the Waves 7 and 9 assessments, adolescents reported on their alcohol problems over the past 12 months using the Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al., 2006). Adolescents reported their experience of 48 alcohol problems (e.g., "Because of my drinking, I have not eaten properly") across a broad range of domains comprising social/interpersonal, impaired control, self-perception, self-care, risky behaviors, academic/occupational, physiological dependence, and blackout drinking problems. Total sum scores across the dichotomous (*yes/no*) items were calculated at the Wave 7 and 9 assessments (α = .98 and .98, respectively). The YAACQ has strong psychometrics, including high test-retest reliability and both concurrent and predictive validity (Read et al., 2006; Read et al., 2007).

Socioeconomic Status—During the Wave 1 assessment, caregivers reported on their annual family income before taxes. Family income was included as a covariate representing a proxy of socioeconomic status, which has been associated with coping-motivated drinking in adolescence (Martin et al., 2019; Stapinski et al., 2016).

Data Analytic Strategy

Descriptive statistics and bivariate correlation coefficients among study variables were conducted in SPSS, Version 28. Coping and enhancement/social motives were generally normally distributed (skewness = −0.04 – 1.65; kurtosis = −1.18 – 3.03). Adolescent alcohol

use (skewness = 2.46 – 3.05; kurtosis = 8.21 – 11.93) and alcohol problems (skewness = 1.67 – 2.07; kurtosis = 3.05 – 6.07) were non-normally distributed, and robust estimators were applied for analyses. Multivariate outlier analyses based on Mahalanobis distance using a χ^2 distribution identified four significant multivariate outliers (Mahalanobis D^2 = 35.11 – 58.88, $p < .001$; Tabachnick & Fidell, 2017), and ancillary analyses suggested results generally were robust to multivariate outliers.[1]

Structural equation modeling was conducted in Mplus, Version 7.4 (Muthén & Muthén, 1998–2017). Maximum likelihood estimation with robust standard errors (MLR) was specified to accommodate missing data and non-normality in alcohol motives, use, and problems (Muthén & Muthén, 1998–2017). Unconditional latent growth curve models were specified to examine trajectories of alcohol motives across Waves 7–9. Growth of coping motives was of primary interest for study hypotheses, with growth of enhancement/ social motives also specified to statistically control for positive affect drinking motivations. Time-specific residual covariances between coping and enhancement/social motives were specified, and correlations among alcohol motives growth factors were included. Growth modeling began by specifying an intercept-only model with latent intercepts (i.e., mean motives at Wave 7) for both coping and enhancement/social motives. Comparison models then examined support for the addition of latent linear slopes (i.e., average rate of linear change in motives from Waves 7 to 9) to the intercept-only model. Factor loadings for the intercept were set to 1, and factor loadings for the slope were set to 0, 1, and 2 to represent measurement intervals by years. The final model was selected based on parsimony, chi-square difference testing, and model fit indices. Specifically, nested intercept-only and intercept with linear slope models were compared using MLR-adjusted chi-square difference tests (Satorra & Bentler, 2010). Multiple model fit indices also were generated. Root Mean Square Error of Approximation (RMSEA) 0.06, Comparative Fit Index (CFI)/Tucker-Lewis Index (TLI) 0.95, and Standardized Root Mean Square Residual (SRMR) 0.08 were interpreted to indicate good model fit (Hu & Bentler, 1999).

Conditional latent growth curve models were estimated to examine relations among alcohol motives growth factors with stressful events and changes in alcohol use and problems, after controlling for family income as a proxy of socioeconomic status. Conditional latent growth curves tested whether stressful events at Wave 3 predicted alcohol motives growth factors from Waves 7–9 and, in turn, if these growth factors predicted changes in alcohol use and problems from Wave 7 to Wave 9. Stressful events, alcohol use, and alcohol problems represented manifest variables, and alcohol motives represented latent variables derived as above. Separate models were tested for each stressful event index due to high overlap among these predictors and concerns with multicollinearity (see Table 1). Finally, analyses tested indirect effects of coping motives in associations of stressful events with changes in alcohol use and problems. Paths from Wave 3 stressful events to coping growth factors represented *a* paths, and paths from coping growth factors to Wave 9 alcohol use and problems represented

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[1]Ancillary analyses excluding multivariate outliers yielded the same pattern of significance for direct and indirect paths, except that the path from conflict events to Wave 9 alcohol problems became significant, the path from degree of upset to coping intercept became marginally significant, and the paths from coping intercept to Wave 9 alcohol problems in the separation events and degree of upset models became marginally significant.

b paths. Consistent with recommendations, indirect effects were tested regardless of the significance of the total effect (Hayes, 2009; Rucker et al., 2011; Zhao et al., 2010), and indirect effects were tested when the *a* and *b* paths were found to be significant. The Monte Carlo Method for Assessing Mediation (MCMAM; MacKinnon et al., 2004; Preacher & Selig, 2012) was utilized to test indirect effects, which has outperformed alternative methods (MacKinnon et al., 2004). Using 20,000 repetitions, 95% confidence intervals for the indirect effect were generated from unstandardized regression coefficients and asymptotic sampling variances (Selig & Preacher, 2008). Confidence intervals not encompassing zero were interpreted to suggest significant indirect effects of stressful events on alcohol outcomes through coping motives.

Results

Descriptive Statistics

Descriptive statistics and bivariate correlation coefficients among study variables are shown in Table 1. On average, adolescents experienced almost five stressful events ($M = 4.92$; $SD = 2.69$; range = 0 – 15) based on caregiver report at Wave 3. While total events were not significantly correlated with adolescent alcohol motives, use, or problems (rs = −.10 to .08, ps > .05), additional indices of stressful events were related to coping motives. Specifically, adolescents experiencing more conflict events tended to report greater coping motives at Waves 8 and 9 (rs = .13, p = .03). Adolescents who experienced more separation events as well as those more upset by experienced stressful events also tended to report greater coping motives at Wave 9 (rs = .12 to .13, p = .03 to .046). Greater coping motives, in turn, were correlated with greater alcohol use and alcohol problems across assessments (rs = .11 – .49, p < .05).

Unconditional Latent Growth Curve Models of Alcohol Motives

The best-fitting growth model differed between coping and enhancement/social motives. Regarding coping motives, the intercept-only model demonstrated good model fit (RMSEA = 0.03[0.00,0.09], CFI = 0.99, TLI = 0.99, SRMR = 0.05). There was significant variability in the latent intercept of coping motives (i.e., variance of intercept; $b = 0.29$, $p < .001$). There was not a significant improvement in model fit with the addition of a linear slope, Satorra-Bentler scaled $\chi^2(3) = 4.82$, $p = .19$. Thus, the final model for coping motives included a random intercept only. Regarding enhancement/social motives, the intercept-only model demonstrated poor model fit (RMSEA = 0.10[0.06,0.15], CFI = 0.93, TLI = 0.95, SRMR = 0.11). There was a significant improvement in model fit with the addition of a linear slope, Satorra-Bentler scaled $\chi^2(3) = 17.86$, $p < .001$. Enhancement/social motives tended to increase over time (i.e., positive mean of the linear slope; $b = 0.09$, $p = .003$). There was also significant variability in the initial level (i.e., variance of intercept; $b = 1.01$, $p < .001$) and rate of change (i.e., variance of linear slope; $b = 0.12$, $p = .01$) of enhancement/social motives. Thus, the final model for enhancement/social motives included a random intercept and linear slope, which demonstrated good model fit (RMSEA = 0.00[0.00,0.07], CFI = 1.00, TLI = 1.02, SRMR = 0.00).

Conditional Latent Growth Curve Models

Regarding the Total Events Model, total stressful events were not significantly associated with coping intercept ($b = 0.02$, β = .07[−.02,.16], $p = .11$) or enhancement/social intercept ($b = −0.02$, β = −.06[−.16,.05], $p = .28$) or slope ($b = −0.00$, β = − .02[−.18,.14], $p = .81$; see Table 2). Coping intercept was not significantly associated with alcohol use ($b = 0.14$, β = .01[−.24,.27], $p = .93$) and fell shy of significance for problems ($b = 2.16$, β = .16[.00,.32], $p = .05$) at Wave 9.

Regarding the Conflict Events Model, conflict events were significantly associated with coping intercept ($b = 0.03$, β = .14[.04,.23], $p = .01$) but not enhancement/social intercept ($b = −0.02$, β = −.05[−.15,.05], $p = .36$) or slope ($b = 0.00$, β = .04[−.12,.19], $p = .64$). Coping intercept was significantly associated with alcohol problems at Wave 9 ($b = 2.47$, β = .19[.02,.35], $p = .03$), and there was a significant indirect effect of coping intercept in the relation between conflict events and change in alcohol problems over time (CI = 0.014,0.120). That is, adolescents who experienced more conflict events at Wave 3 tended to report greater levels of coping-motivated drinking and, in turn, increases in alcohol problems from Waves 7 to 9 (see Figure 1). Coping intercept was not significantly associated with alcohol use at Wave 9 ($b = 0.19$, β = .02[−.25,.28], $p = .91$).

Regarding the Separation Events Model, separation events were not significantly associated with coping intercept ($b = −0.02$, β = −.04[−.15,.07], $p = .45$) or enhancement/social intercept ($b = 0.03$, β = .04[−.07,.15], $p = .45$) or slope ($b = −0.02$, β = −.08[−.24,.09], $p = .38$). Coping intercept was significantly associated with alcohol problems ($b = 2.18$, β = .16[.01,.32], $p = .04$) but not alcohol use ($b = −0.10$, β = −.01[−.26,.25], $p = .95$) at Wave 9. Separation events were not significantly associated with alcohol use ($b = −0.07$, β = −.02[−.13,.10], $p = .79$) or problems ($b = 0.47$, β = .09[−.01,.19], $p = .08$) at Wave 9, above and beyond drinking at Wave 7.

Regarding the Degree of Upset Model, degree of upset was significantly associated with coping intercept ($b = 0.01$, β = .10[.003,.20], $p = .04$) but not enhancement/social intercept ($b = −0.01$, β = −.06[−.16,.05], $p = .28$) or slope ($b = 0.00$, β = .01[−.16,.18], $p = .91$). Coping intercept was significantly associated with alcohol problems ($b = 2.21$, β = .16[.004,.32], $p = .04$) but not alcohol use ($b = 0.23$, β = .02[−.24,.28], $p = .89$) at Wave 9. There was no significant indirect effect of coping intercept in the relation between degree of upset and change in alcohol problems over time (CI = −0.0003,0.040), and degree of upset was not significantly associated with alcohol use ($b = −0.11$, β = −.10[−.20,.003], $p = .06$) or problems ($b = −0.03$, β = −.03[−.11,.06], $p = .58$) at Wave 9, above and beyond drinking at Wave 7.

Discussion

The current study examined associations of early adversity with adolescent alcohol outcomes through coping-motivated drinking. This study advanced existing literature by using a longitudinal design spanning early to late adolescence and by delineating among specific types of early adversities assessed more proximally to their occurrence. Findings supported elevations in coping, but not enhancement/social, motives up to six years after

the experience of conflict events early in life. Coping motives, in turn, were related to increases in alcohol problems across late adolescence. In contrast, neither separation events nor experience or perceived impact of additional stressful events were related to adolescent alcohol outcomes through coping or enhancement/social drinking motives. Findings suggest that alcohol problems in the aftermath of upsetting early conflict experiences may be driven, at least in part, by negative affect regulation mechanisms through coping-motivated drinking. Findings from this work offer insight into the etiologies of alcohol outcomes in the aftermath of adverse experiences and may have implications for efforts to reduce the burdens of alcohol problems among individuals who have experienced early conflict.

Results demonstrated that conflict events in early adolescence were linked to greater coping motives and, in turn, escalations in alcohol problems across late adolescence. Thus, increased desire to drink to cope with negative emotion appears to be a risk pathway for later alcohol problems among adolescents exposed to disruptive family conflict. This coping-motivated drinking pathway was evident even when controlling for typical alcohol use, suggesting unique links to problem alcohol involvement. Conflict events early in life may be a particularly poignant source of distress, leaving adolescents more motivated to use alcohol to manage distress and negative emotion. Findings support distress coping models (Grayson & Nolen-Hoeksema, 2005; Polusny & Follette, 1995) and highlight the role of negative in contrast to positive affect regulation in driving early adversity's links with subsequent alcohol outcomes. The current study extends prior research on coping-motivated drinking after early adversity as derived from cross-sectional (Hogarth et al., 2019; Shin et al., 2020) and quasi-temporally ordered (Hannan et al., 2017; Mezquita et al., 2014; Park et al., 2019; Topper et al., 2011) designs. Results from the current adolescent sample also are concordant with additional longitudinal findings on coping-motivated drinking following a variety of stressors and traumatic experiences in adulthood (Hawn, Bountress, et al., 2020; Lindgren et al., 2012; Miller et al., 2017). Such investigations converge to support coping motives as a critical mechanism through which adversities across developmental stages confer risk for later alcohol outcomes. Findings suggest that clinical efforts could target coping skills and coping-motivated drinking interventions toward adolescents exposed to upsetting family conflict in an effort to buffer the impacts of early life conflict on later problem drinking.

Coping-motivated drinking was associated with increases in alcohol problems through late adolescence, despite no significant increases in coping motives over this time. Results suggest that coping motives, once developed, may remain relatively stable in later adolescence while continuing to impact adverse alcohol outcomes. That is, elevations in coping motives may emerge early and then persist into late adolescence, increasing risk for subsequent alcohol problems. The current study only examined these risk processes through late adolescence, such that it remains unknown whether elevated coping motives continue to influence drinking outcomes even later in development. Future research would benefit from examining any longer-term associations of conflict events with alcohol outcomes through coping motives in an effort to characterize more persisting effects of early life conflict. Additionally, coping motives conferred risk for increases in alcohol problems indirectly, even in the absence of a significant direct effect of conflict events on alcohol problems. Total or direct effects are not necessary for establishing indirect effects (Hayes, 2009;

Rucker et al., 2011; Zhao et al., 2010). For example, there may be multiple mediators through which experience of conflict events influences later alcohol problems, some of which exert opposite effects on alcohol outcomes that serve to obscure any total or direct effect (e.g., social withdrawal leading to reduced time in alcohol-promoting peer networks; greater motivation to avoid additional conflict related to alcohol; Hayes, 2009; MacKinnon et al., 2000; Rucker et al., 2011). Future research exploring these and additional possibilities would help shed light on the complex and multifaceted relations between early adversity and alcohol outcomes later in life.

Research attempting to disaggregate the specific types of early adversities related to alcohol outcomes has been limited, and the current study aimed to expand this work by examining a broader array of potential adverse childhood experiences. Findings suggest particular vulnerability to coping-motivated drinking conferred by upsetting conflict events. Conflict events encompassed physical violence (not necessarily directed at the adolescent), serious illness/injury, arguments, and problems with the law all occurring within the family, while the additional stressful events tested included changes in living situations, peer relationships, challenges experienced by close friends, and other life circumstances. Family conflict may provoke emotion disequilibrium or prompt adolescents to seek out strategies to cope with resulting emotional strain (Schulz et al., 2005), which may serve to increase risk for subsequent coping-motivated drinking. In addition, adolescents may experience disruptive events occurring within the family more profoundly than those that are more distal, occurring outside of their immediate family environment. The current study was innovative in that it also examined separation events leading to family disruption (e.g., decreased contact with important family members through arrest, death, divorce, etc.) that have been less frequently studied. However, these events were experienced by a smaller portion of the sample (35% in our sample) relative to conflict events (78%), and their less frequent occurrence may have made it difficult to detect associations with coping motives. Findings from the current research suggest that even witnessing family disruptions can increase risk for coping-motivated problem drinking, in addition to directly experiencing abuse or neglect as demonstrated in past work (Hogarth et al., 2019; Mezquita et al., 2014; Park et al., 2019; Shin et al., 2020). Future research is needed to replicate these novel findings and continue to explore diverse early stressors that confer risk for coping-motivated drinking. Such efforts could identify adolescents at risk for alcohol problems based on their specific early life experiences to help target prevention/intervention efforts.

Findings should be interpreted within the context of several limitations. First, growth in coping motives was modeled across late adolescence. Coping motives varied considerably over time in prior research across additional stages of development, particularly earlier adolescence (Cooper et al., 2008) and into later adulthood (Littlefield et al., 2010). Future work could test whether coping motives increase more rapidly among adolescents with childhood adversity or if coping motives emerge higher initially among exposed adolescents. Future work could also delineate when motivational processes are most dynamic to help target clinical efforts. Second, findings were based upon correlational data, and alcohol use was assessed retrospectively. Early life adversity may elicit increases in coping motives that lead to alcohol outcomes, or adolescents raised in families with greater alcohol use may experience more adverse events and also acquire more favorable alcohol cognitions.

Relatedly, although the current study tested growth in coping motives following early adversity, there was some temporal overlap between the final assessments of coping motives and alcohol outcomes. Research utilizing full temporally ordered investigations with careful consideration of potential psychosocial confounds would aid in replication efforts. Third, stressful events only were assessed over the past year at Wave 3 using parent reports. While this approach may have minimized some retrospective bias, the data cannot address any potential impact of events earlier or later in development. Parent report of stressful events may have helped reduce concerns with inflation of associations compared to reliance on adolescent report for all measures. Further, the stressful events items were developed to capture objective, uncontrollable events (Sandler et al., 1992), suggesting that parents may have been reasonably able to report on the events. Nonetheless, adolescents undoubtedly would provide useful information on their own experiences, and future work should capture adolescents' report of their stressful events. Finally, well-powered replication efforts across diverse samples are needed. Results were based upon a community sample of predominantly White adolescents in the northeastern United States. Findings support stress-related drinking pathways in an unselected community sample. Prior cross-sectional and more temporally limited work also support similar coping-motivated drinking within more diverse samples, including Canadian aboriginal (Stewart et al., 2011), English (Topper et al., 2011), Scottish (Martin et al., 2019), and South African (Hogarth et al., 2019) adolescents. Such results support the potential utility of universal stress-related drinking prevention and intervention. Nevertheless, generalizability of the current results to high risk or clinical samples as well as other racial and geographical populations remains to be established. Such efforts are critical, particularly in recognizing the diversity of responses to adverse experiences (see Pole et al., 2008).

The current study demonstrated elevations in coping but not enhancement/social motives throughout late adolescence following family conflict in early life. Such coping-motivated drinking was linked to increases in alcohol problems over time. Findings support negative reinforcement mechanisms underlying the well-documented relations among childhood adversity and alcohol outcomes as outlined by distress coping models. Following replication and generalization efforts, research in this area could begin to be applied clinically to identify adolescents at risk for adverse alcohol outcomes and work to address coping motivated mechanisms of alcohol outcomes in the aftermath of early life adversity.

Acknowledgments

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Public Health Significance Statement:

This study demonstrated that disruptive family relations in early adolescence are linked to greater motivation to drink to cope with negative affect up to six years later. Greater coping motives, in turn, were related to increases in alcohol problems over time, even when controlling for alcohol consumption.
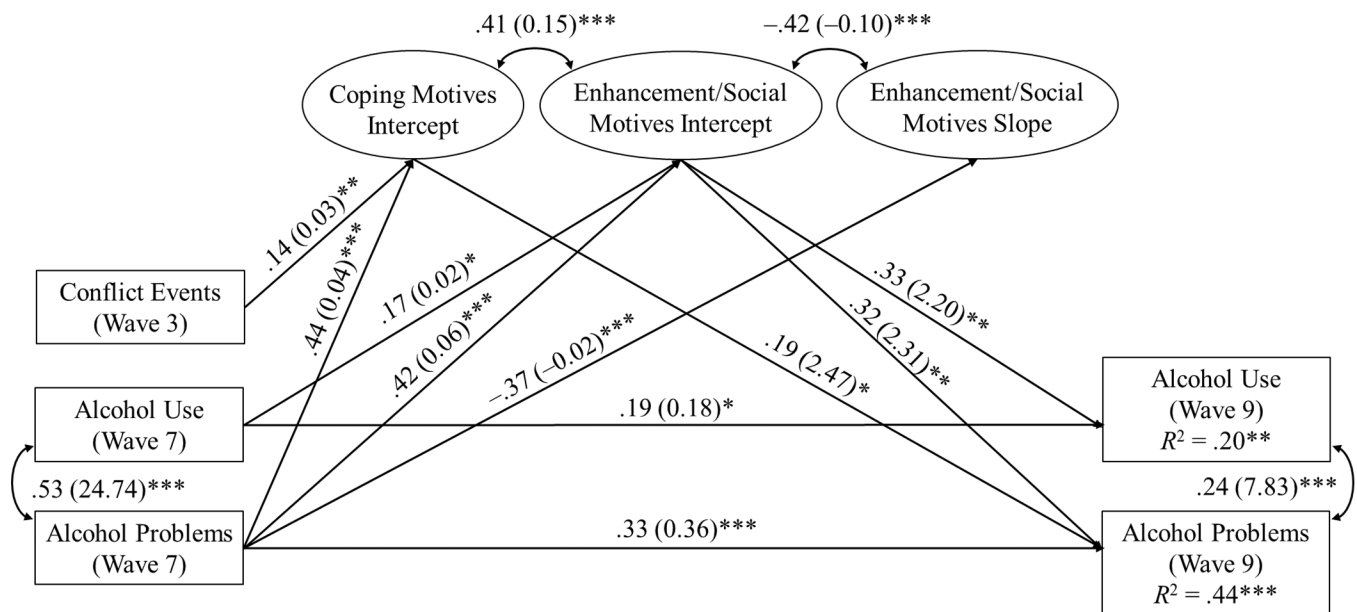
Figure 1.
Standardized estimates (and nonstandardized estimates in parentheses) shown for relations among conflict events with adolescent alcohol motives, use, and problems. Alcohol motives growth factors were estimated across Wave 7 (M_{age} = 18.4 years), Wave 8 (M_{age} = 19.4 years), and Wave 9 (M_{age} = 20.4 years). Conflict events were assessed by caregiver report at Wave 3 (M_{age} = 14.1 years). Family income was included as a covariate, although paths are not shown for simplicity.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1.

Descriptive Statistics and Bivariate Correlations Among Study Variables

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Stressful events, total (14 years)	4.92 (2.69)	—												
2. Stressful events, conflict (14 years)	2.65 (2.71)	.68***	—											
3. Stressful events, separation (14 years)	0.92 (1.39)	.35***	.19***	—										
4. Stressful events, degree of upset (14 years)	9.38 (6.08)	.88***	.75***	.50***	—									
5. Coping motives (18 years)	1.63 (0.75)	.05	.09	−.09	.07	—								
6. Coping motives (19 years)	1.65 (0.71)	.05	.13*	−.04	.06	.59***	—							
7. Coping motives (20 years)	1.65 (0.72)	.08	.13*	.12*	.13*	.47***	.59***	—						
8. Enhancement/social motives (18 years)	2.70 (1.12)	−.07	−.03	.01	−.07	.47***	.39***	.33***	—					
9. Enhancement/social motives (19 years)	2.81 (1.02)	−.10	−.05	.03	−.08	.33***	.52***	.34***	.69***	—				
10. Enhancement/social motives (20 years)	2.84 (1.01)	−.03	.02	.08	−.00	.27***	.36***	.54***	.56***	.67***	—			
11. Typical weekly drinking (18 years)	3.98 (7.17)	.04	.07	−.01	.06	.42***	.19**	.11*	.39***	.25***	.25***	—		
12. Alcohol problems (18 years)	5.44 (6.64)	−.00	.02	.03	.00	.49***	.33***	.28***	.50***	.34***	.27***	.54***	—	
13. Typical weekly drinking (20 years)	4.54 (6.66)	−.10	−.05	−.01	−.09	.17**	.15*	.23***	.29***	.34***	.33***	.31***	.23***	—
14. Alcohol problems (20 years)	6.70 (7.32)	−.02	−.04	.11	−.01	.28***	.39***	.45***	.45***	.43***	.46***	.31***	.54***	.41***

Note. $N = 254 - 370$, due to missing data. Total stressful events represented a count of the number of stressful events endorsed (possible range = $0 - 27$). Conflict events comprised eight, non-dichotomized items involving disruption of harmonious family relations (possible range = $0 - 24$), and separation events included four, non-dichotomized items capturing decreased contact with important persons (possible range = $0 - 12$). Degree of upset represented a sum of 27, non-dichotomized items capturing overall perceived impact of stressful events (possible range = $0 - 81$). Coping motives represent average subscale scores at each wave (possible range = $1 - 5$), and enhancement/social motives represent an average of enhancement and social motives subscales within waves (possible range = $1 - 5$). Typical weekly drinking represents the total number of drinks consumed in a typical week, and alcohol problems represents a count of problems endorsed across a broad range of domains (possible range = $0 - 48$).

*
  $p < .05$.

**
  $p < .01$.

***
  $p < .001$.

Table 2.

Indirect Effects of Coping Motives in Relations of Early Stressful Events with Adolescent Alcohol Use and Problems

Predictor	Mediator	Outcome	a path				b path				c' path			
			b	SE	β[95% CI]	p	b	SE	β[95% CI]	p	b	SE	β[95% CI]	p
Total events	Coping intercept	Use	0.02	0.01	.07[−.02,.16]	.11	0.14	1.60	.01[−.24,.27]	.93	−0.23	0.13	−.09[−.19,.01]	.07
Total events	Coping intercept	Problems					2.16	1.13	.16[.00,.32]	.05	−0.04	0.12	−.02[−.11,.08]	.74
Conflict events	Coping intercept	Use	**0.03**	**0.01**	**.14[.04,.23]**	**.01**	0.19	1.64	.02[−.25,.28]	.91	−0.19	0.13	−.08[−.18,.03]	.15
Conflict events	Coping intercept	Problems					**2.47**	**1.15**	**.19[.02,.35]**	**.03**	−0.24	0.13	−.09[−.18,.00]	.05
Separation events	Coping intercept	Use	−0.02	0.02	−.04[−.15,.07]	.45	−0.10	1.59	−.01[−.26,.25]	.95	−0.07	0.27	−.02[−.13,.10]	.79
Separation events	Coping intercept	Problems					**2.18**	**1.10**	**.16[.01,.32]**	**.04**	0.47	0.27	.09[−.01,.19]	.08
Degree of upset	Coping intercept	Use	**0.01**	**0.01**	**.10[.003,.20]**	**.04**	0.23	1.62	.02[−.24,.28]	.89	−0.11	0.06	−.10[−.20,.00]	.06
Degree of upset	Coping intercept	Problems					**2.21**	**1.12**	**.16[.00,.32]**	**.04**	−0.03	0.05	−.03[−.11,.06]	.58

Note. $N = 387$. Paths significant at $p < .05$ are shown in bold. CI = confidence interval.