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Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg

Coping motives as a mediator of the relationship between child maltreatment and substance use problems in south African adolescents

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ARTICLE INFO

Keywords:

Child maltreatment
Substance use
Coping motives
Adolescents
South Africa

ABSTRACT

Background: Evidence suggests that adults with a history of child maltreatment (CM) engage in substance misuse driven by ‘coping motives’: maladaptive beliefs that substances help them cope with negative emotions. However, the specificity of this risk pathway is under-researched in younger and non-Western cohorts.

Objective: The present study aimed to determine whether coping motives play a distinct role compared to other motives for substance use in mediating the relationship between CM and problematic alcohol and marijuana use in a sample of South African adolescents.

Participants and setting: A sample of 688 high school students (*M* age = 15.03 years; 62.5 % female) in Cape Town, South Africa, completed a cross sectional survey.

Methods: Participants completed self-report measures of CM exposure, motives for using alcohol and marijuana (coping, enhancement, social and conformity), and alcohol and marijuana related problems. Participants who endorsed using alcohol (*N* = 180) or marijuana (*N* = 136) were included in analysis. A parallel mediation model was conducted for each substance (alcohol and marijuana, respectively) to assess which motives mediated the relationship between CM exposure and substance-related problems.

Results: CM exposure predicted both alcohol-and marijuana related problems. The relationship between CM exposure and alcohol-related problems was partially mediated by coping motives ($p < .001$, 95%CI 0.028, 0.115) and, to a lesser extent, conformity motives ($p < .01$, 95%CI 0.001, 0.041), but not by social motives or enhancement motives. The relationship between CM exposure and marijuana-related problems was partially mediated by coping motives ($p < .001$, 95%CI 0.004, 0.037), but not by conformity, social or enhancement motives.

Conclusions: The findings support the importance of coping motives as a mediator between CM and problematic substance use across different substances of abuse in South African adolescents, and the role of conformity motives in problematic alcohol use. Future research should explore whether these findings hold across other sociocultural contexts, and the utility of interventions to address coping motives for substance use in adolescence.

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<https://doi.org/10.1016/j.chiabu.2024.106885>

Received 22 August 2023; Received in revised form 17 May 2024; Accepted 31 May 2024

Available online 8 June 2024

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1. Introduction

Exposure to maltreatment during childhood is an established distal risk factor for alcohol and marijuana use later in life. Child maltreatment (CM) includes all forms of abuse, neglect, or exploitation of a child under 18 years of age, by a parent, caregiver, or someone else in a position of responsibility or power (World Health Organisation [WHO], 2022). In cross-sectional and prospective studies, adolescents and adults with a history of CM are at significantly higher risk than non-maltreated peers for alcohol use, binge drinking, and alcohol use disorders (Guastafarro et al., 2024; Moustafa et al., 2021; Sartor et al., 2018; Shin et al., 2013), as well as marijuana use and dependence (Dubowitz et al., 2016; Halpern et al., 2018; Mersky et al., 2013; Oshri et al., 2011). However, further elaboration is needed to understand the specific psychological mechanisms that increase the risk of substance use among maltreated individuals later in development. Substance use motives are one potential proximal mechanism, as individuals who have experienced CM may have specific motives for using substances that increase the risk of harmful or problematic use (Grayson & Nolen-Hoeksema, 2005; Shin et al., 2020).

1.1. Substance use motives and CM

Four key motivations for engaging in substance use have been identified: approach or positive reinforcement motives, such as socialising with others and enhancing positive feelings of pleasure or excitement, and avoidance or negative reinforcement motives, such as conformity to avoid social rejection, and coping with negative feelings (Cooper, 1994; Cox & Klinger, 1988). In line with the self-medication model of substance use (Khantzian, 1997), coping motives describe the maladaptive belief that substances will help to alleviate or avoid feelings of distress, depression, and anxiety. The capacity to effectively regulate negative emotions develops in childhood through relationships with warm and supportive primary caregivers who model and validate expression of emotions, labelling of emotions, and effective emotional regulation strategies (Dvir et al., 2014; Gruhn & Compas, 2020). In homes characterized by child maltreatment, such caregiver responses are often absent. As a result, children who have been maltreated are more emotionally reactive to stress, less able to understand and recognize emotions, and less able to effectively regulate their emotions than non-maltreated children (Dvir et al., 2014; Gruhn & Compas, 2020; Weissman et al., 2019). Difficulties with emotional regulation persist well beyond childhood (Dutcher et al., 2017; Warmingham et al., 2023) and individuals with histories of CM may engage in substance use to regulate their distressing emotions later in development (Shin et al., 2015).

Using substances to cope with negative feelings can increase the risk for excessive and harmful substance use. In a range of adult populations, including college students (Merrill et al., 2014; Shuai, Anker, et al., 2022) and military veterans (McDevitt-Murphy et al., 2015), coping motives are associated with heavier consumption of substances and more problematic substance use (PSU; that is, substance use that negatively impacts the user's functioning socially, physically, emotionally, financially, or legally [Hafford-Letchfield et al., 2020]) than other motives. Among young adults with a history of CM, coping motives may be a particularly prominent risk factor for PSU. In college students, coping motives were the only substance use motive to mediate the relationship between CM and alcohol use problems (Mezquita et al., 2014; Shin et al., 2020). Similarly, only coping motives mediated between CM and marijuana use problems in community samples of young adults (Meshesha et al., 2019; Vilhena-Churchill & Goldstein, 2014). These findings suggest that coping motives could offer an important target for substance prevention and intervention programs among young adults who have experienced CM. However, the specificity of coping motives (as opposed to other motives) in increasing the risk of PSU in individuals with histories of maltreatment is not entirely clear. Difficulties with emotional regulation encompass the capacity for regulating both negative and positive emotions, and individuals who have experienced CM may engage in substance use not only to reduce negative affect states but also to enhance positive affect states. In line with this, both coping and enhancement motives were found to mediate between CM and later alcohol use in a community sample of adult women (Grayson & Nolen-Hoeksema, 2005) and among college students (Shin et al., 2020). In another college student sample, coping and enhancement motives were both significant mediators for men, but only coping motives mediated for women (Goldstein et al., 2010). The latter finding indicates that sex or gender may determine which motives are most influential, but no consistent patterns have yet emerged.

1.2. Substance use motives in adolescents with a history of CM

While coping motives appear to create risk for PSU among adults with histories of CM, we currently lack a more developmentally informed understanding of this specific risk pathway as it has seldom been explored with adolescent samples. Adolescence is the peak developmental stage for the initiation of substance use and the global burden of disease attributable to substance use increases significantly during adolescence and young adulthood (18–25 years) (Degenhardt et al., 2016). Substance use during adolescence is associated with an increased risk for school non-completion (Davis et al., 2023), college attrition (Patrick et al., 2016), alcohol-related problems in adulthood (Wallace et al., 2024), and long-term cognitive deficits (Hanson et al., 2011). Identifying risk factors for adolescent substance use that may point to potential mechanisms for prevention and intervention is therefore a critical public health priority.

Adolescence is a time of increased emotional reactivity and vulnerability to anxiety, stress and depression (Ahmed et al., 2015). The motivation to use substances to avoid negative emotions may therefore be especially strong during this period. As with adults, coping motives are associated with an increased risk for alcohol- and marijuana-related problems in adolescents (Blevins et al., 2016; Kuntsche & Müller, 2011; Wicki et al., 2017). However, few studies have examined whether coping motives mediate the relationship between CM and substance-use problems at this developmental stage. Among Canadian adolescents in the child welfare system,

posttraumatic stress and coping motives contributed sequentially to the relationship between maltreatment and alcohol misuse (Park et al., 2019). In the only study to date to assess the mediating role of motivations for substance use in the CM-substance use relationship outside of high-income, Western contexts, coping motives mediated the relationship between CM and alcohol and drug problems in South African adolescents (Hogarth et al., 2019). However, neither study established the specificity of coping motives as a mediator, or its relative magnitude as a mediating pathway, by comparing it with other motives for substance use. It is possible that during adolescence certain substance use motives may be more influential than they are in adulthood. For example, adolescents who have experienced CM are more likely than their non-maltreated counterparts to experience social rejection by mainstream peers, and to then seek acceptance from deviant peers who provide positive validation for risk-taking behaviours like substance use (Hovdestad et al., 2011; Yoon et al., 2020). These findings suggest that social or conformity motives for using substances, such as seeking social rewards or avoiding social rejection, are prominent in this developmental stage. The role of enhancement motives in mediating between CM and substance use reported in some studies with adults (see Section 1.1. above) has not yet been explored with adolescents. If more than one substance use motive plays a mediating role in the CM-substance use relationship for adolescents, directly comparing the magnitude of these different pathways to see which are most influential could inform the focus of future prevention and intervention initiatives for this high-risk group. As adolescence is a time of rich neurological growth and development (Kadosh et al., 2013), interventions at this developmental stage could be particularly effective and potentially reduce the risk of PSU in adulthood.

In addition to developmental considerations, cultural factors may determine which motivations for using substances are most influential. For example, college students in individualistic cultures (such as the United Kingdom or Switzerland) are more likely than those from collectivist cultures (such as Brazil and Portugal) to use substances for social and enhancement motives, possibly due to a stronger emphasis on approach motivations in individualistic cultures (MacKinnon et al., 2017). Other than the study by Hogarth et al. (2019), substance use motives have not been examined as mediators of PSU among maltreated adolescents in non-Western countries.

1.3. Aims of current study

Substance use motives, particularly coping and enhancement motives, have been found to play an important role in the development of PSU in adults with histories of child maltreatment, but comparatively little is known about the role of substance use motives among maltreated adolescents. In addition, research on substance use motives in maltreated populations has largely been conducted in Western countries. Hogarth et al.'s (2019) research with a South African adolescent sample began to address these gaps, but only examined the role of coping motives in mediating between CM and adolescent substance use. The current study aims to extend this research to examine whether each of the four motives for substance use (coping, conformity, social, enhancement) mediate the relationship between CM and problematic alcohol and marijuana use among South African adolescents. It also aims to compare the magnitude of effects of these candidate mediators, to examine which are most influential. Overall, the study aims to contribute to a more fine-grained understanding of the role of different motivations for substance use in the risk pathway from CM to PSU among developmentally younger samples and to enhance representativity of research on this topic from non-Western contexts.

2. Methods

2.1. Setting

Participants were 688 grade 8–11 high school learners in three government high schools in Cape Town, in the Western Cape province of South Africa. The percentage of South African adolescents with a history of CM is high compared to many high-income countries (Meinck et al., 2016). Substance use is also prevalent, with 49 % of adolescents reporting alcohol use and 13 % reporting marijuana use (Reddy et al., 2013). The Western Cape has one of the highest prevalence rates of substance use compared to other provinces, with 66 % of adolescents reporting alcohol use and 24 % reporting marijuana use (Morojele et al., 2013).

The three schools were accessed via a non-government organisation that places trauma counselling interns in Cape Town high

Table 1
Sample characteristics split by whole sample, and substance use subsamples.

Variable	Category	Whole sample (<i>n</i> = 688)	Alcohol use (<i>n</i> = 180)	Marijuana use (<i>n</i> = 136)
Gender	Female	430 (62.8 %)	133 (73.9 %)	96 (70.6 %)
	Male	233 (34.0 %)	44 (24.4 %)	34 (25 %)
	Prefer to self-identify	22 (3.2 %)	3 (1.7 %)	6 (3.7 %)
Age	Mean	15.03	15.18	15.11
	SD	1.07	1.04	0.93
	Range	13–18	13–18	14–17
First Language	English	293 (43.0 %)	55 (30.7 %)	58 (43.0 %)
	isiXhosa	341 (50.1 %)	113 (63.1 %)	68 (50.4 %)
	Afrikaans	24 (3.5 %)	8 (4.5 %)	7 (5.2 %)
	Other	23 (3.4 %)	3 (1.7 %)	2 (1.5 %)
Grade	8	236 (34.4 %)	60 (33.3 %)	42 (30.9 %)
	9	269 (39.2 %)	68 (37.8 %)	61 (44.9 %)
	10	144 (21.0 %)	39 (21.7 %)	23 (16.9 %)
	11	37 (5.4 %)	13 (7.2 %)	10 (7.4 %)

Table 2
Bivariate correlations and descriptive statistics of study variables for alcohol use.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	–													
2. Gender ^a	0.36**	–												
3. Alcohol use frequency	–0.05	0.08	–											
4. Coping motive	–0.06	–0.14	0.16*	(0.95)										
5. Conformity motive	–0.16*	–0.05	0.07	0.34**	(0.88)									
6. Social motive	–0.04	–0.03	0.06	0.45**	0.27**	(0.83)								
7. Enhancement motive	0.00	–0.06	0.14	0.54**	0.21**	0.75**	(0.85)							
8. Emotional abuse	–0.04	–0.11	0.06	0.41**	0.21**	0.14	0.10	(0.81)						
9. Physical abuse	–0.09	–0.03	0.10	0.47**	0.24**	0.22**	0.24**	0.58**	(0.75)					
10. Sexual abuse	0.00	–0.14	0.08	0.27**	0.14	–0.01	0.08	0.40**	0.33**	(0.84)				
11. Emotional neglect	–0.07	–0.08	0.14	0.29**	0.11	–0.04	0.04	0.50**	0.34**	0.24**	(0.78)			
12. Physical neglect	–0.06	0.08	0.17*	0.21**	0.13	0.01	0.08	0.27**	0.23**	0.19*	0.54**	(0.45)		
13. CM (overall)	–0.07	–0.08	0.13	0.47**	0.24**	0.07	0.103	0.82**	0.74**	0.65**	0.73**	0.56**	(0.89)	
14. Alcohol problems	–0.06	–0.02	0.32**	0.58**	0.37**	0.44**	0.515**	0.31**	0.40**	0.25**	0.13	0.20**	0.35**	(0.91)
Mean	15.18	1.25	1.21	15.46	3.73	21.26	16.29	10.66	8.42	7.87	9.74	7.13	44.34	7.64
SD	1.04	0.43	0.47	17.43	8.31	13.88	14.20	5.71	4.56	4.77	4.72	2.90	16.20	8.77
Range	13–18	F/M (133/44)	1–3	0–62.50	0–50	0–50	0–50	1–25	1–25	3–25	2–25	2–19	2–102	0–51

Note. a = Gender ratio was reported to two categories for gender, due to no sufficient data ($N = 3$) in the categories of “I identify as neither or as both” or “Prefer not to say”. Males are the reference category.

All unadjusted values significance indicated by * = $p < .05$, ** $p \leq 0.01$ *** $p \leq 0.001$.

Values in emboldened remained significant following Bonferroni corrections ($p < .003$). Cronbach Alpha reported in the diagonal of the table.

schools. This ensured there would be counselling support available for any students who felt distressed or worried about the survey content. The grade levels were selected to capture ‘middle adolescence’, as this has been indicated by previous research as a critical period for the initiation of substance use behaviours in South African adolescents (Madu & Matla, 2003; Moodley et al., 2012).

Sample characteristics are described in Table 1 in the results. Although participants spoke a variety of South African languages at home, all three schools utilized English as the medium of instruction, and the school principals and teachers confirmed that all learners were suitably proficient in English.

2.2. Instruments

An author-constructed questionnaire assessed demographics (age, grade, gender, and language). Cronbach alpha values for all scales are reported in Tables 2 and 4 in the results.

2.2.1. Childhood maltreatment

Lifetime exposure to CM was assessed with the *Childhood Trauma Questionnaire-Short Form* (CTQ-SF; Bernstein et al., 2003), a 28-item self-report measure with five subscales (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect). Items (e.g., “I believe I was physically abused”) were summed to obtain a total CM exposure score. The reliability and validity (concurrent and discriminant using structured trauma interviews) of the CTQ-SF has been established in samples of adolescents across different countries (Aloba et al., 2020; Grassi-Oliveira et al., 2014; Hagborg et al., 2022; Mizuki & Fujiwara, 2021), including South Africa (Hogarth et al., 2019).

2.2.2. Substance use

Frequency and quantity of alcohol and marijuana use were assessed with three items (e.g., “How often do you have a drink containing alcohol?”) from the Alcohol Use Disorders Identification Test (AUDIT) and the Drug Use Disorders Identification Test (DUDIT; Berman et al., 2004) (e.g., “How often do you use marijuana?”), respectively. Both measures have previously been used with South African adolescents, demonstrating good internal consistency (Hogarth et al., 2019).

2.2.3. Alcohol problems

Problems related to alcohol use were assessed with the *Rutgers Alcohol Problems Index* (RAPI; White & Labouvie, 1989), a 23-item self-response questionnaire assessing how often problems related to drinking (including aggressive behavior, neglecting responsibilities, and adverse psychological reactions to drinking) occurred in the last year (e.g., “Neglected your responsibilities”). The composite score reflects severity of alcohol-related problems. Reliability and validity of the scale have been established with adolescent samples (López Núñez et al., 2012; Shono et al., 2018).

2.2.4. Marijuana problems

Problems related to marijuana use were assessed with the *Brief Marijuana Consequences Questionnaire* (BMCQ; Simons et al., 2012), a 21-item measure assessing problems related to marijuana use in the past month, including risky behavior, negative physiological effects, and negative psychological consequences of marijuana use (e.g., “I haven’t been as sharp mentally because of my marijuana use”). The composite score indicates severity of negative consequences of marijuana use. The BMCQ has demonstrated good reliability and discriminant validity (Simons et al., 2012) and good internal consistency in cross-cultural samples (Bravo et al., 2019).

2.2.5. Drinking motives

Drinking motives were assessed with the *Modified Drinking Motives Questionnaire-Revised* (MDMQ-R; Grant et al., 2007), a 28-item scale assessing five drinking motives (enhancement, conformity, and social motives, coping with depression and coping with anxiety), with a sub-scale score for each motive (e.g., “to reduce my anxiety”). It has been validated with adolescents (Grant et al., 2007) in various European countries (Kuntsche et al., 2014; Mezquita et al., 2016) but not, to our knowledge, in South Africa. As the coping-depression and coping-anxiety subscales were very highly correlated ($r = 0.77, p < .001$), they were averaged to form a single coping score.

2.2.6. Marijuana motives

Motives for marijuana use were assessed with the *Marijuana Motives Measure* (MMM; Simons et al., 1998), a 25-item measuring five motives (social, coping, enhancement, conformity, and expansion), with a sub-scale score for each motive (e.g., “To fit in with the group I like”). Its reliability in adolescent samples has been established (Dash & Anderson, 2015). We omitted the expansion subscale from the analysis as there is no equivalent in the MDMQ-R. This approach allowed close equivalence of the mediation model tested in relation to alcohol and marijuana.

2.3. Procedures

Prior to administration, informed consent was obtained from parents/caregivers and participants 18 years of age, and assent was obtained from participants younger than 18 years. Paper-based questionnaires were administered by the researchers to participants in their classrooms, with desks spaced apart to ensure privacy. Questionnaires were anonymized by using participant numbers for each survey pack, with no names provided. Where parent consent ($n = 2$) and/or student assent ($n = 59$) was not provided, students

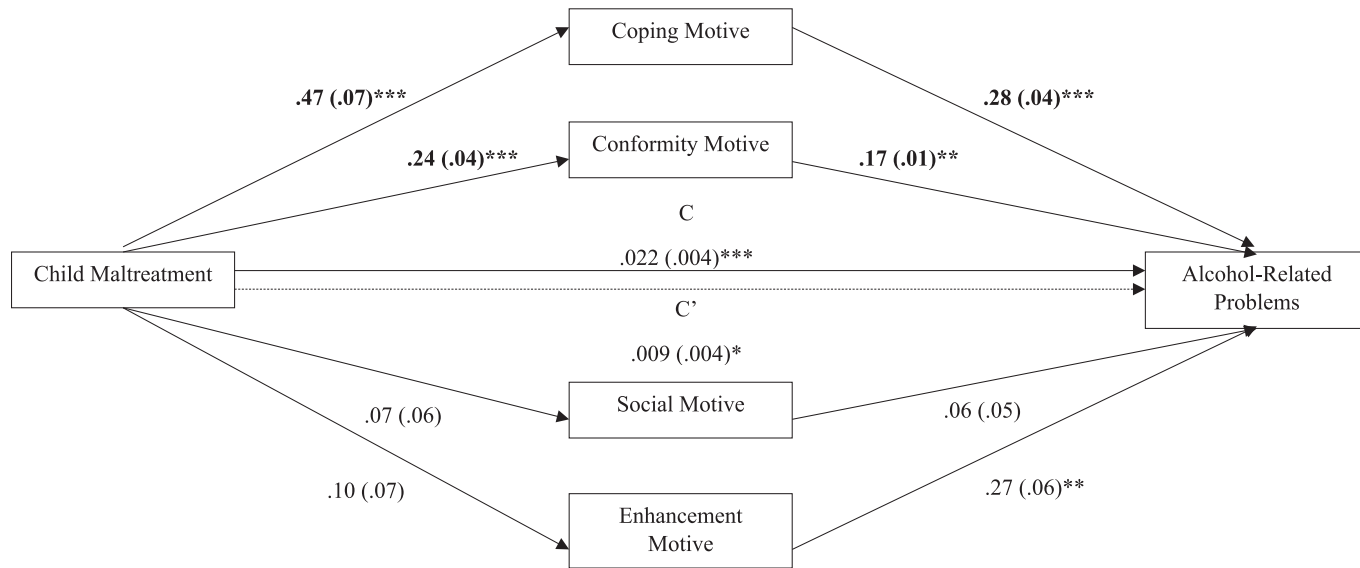


Fig. 1. SEM mediation path model for alcohol use ($N = 180$). For each connecting line, the standardized beta value between the two variables is shown. The 10,000-percentile bootstrapped standard error of each beta value is shown in brackets. Significant beta values are labelled as $*p < .05$, $**p < .01$, $***p < .001$. Significant indirect path values are displayed as emboldened. Both coping, and conformity motives partially mediate the relationship between childhood maltreatment and alcohol related problems, with coping motives accounting for 37.50 % of total effects, and conformity accounting for 10.94 % of total effects.

completed schoolwork at their desks during data collection for the study. Teachers were not present in the classroom during questionnaire administration. After the survey, participants were given verbal and written instructions for accessing resources for trauma and/or substance use, including in-school (e.g., the trauma counselling intern) and community-based resources (e.g., a non-profit substance abuse counselling service and a non-profit trauma counselling service within close proximity to each school).

2.4. Data analysis

Participants who reported never having used alcohol or marijuana or had any missing values on the main study variables were excluded from analysis. Of the total sample, 180 (26.16 %) reported ever having used alcohol and 136 (19.77 %) reported ever having used marijuana. These two samples were analysed independently, as the mediating role of substance use motives may differ for each drug class. IBM SPSS v.28 was used for assumption checks, bivariate correlations, and descriptive statistics independently for each substance use group (alcohol and marijuana). Each group was assessed for univariate outliers to ensure extreme values did not skew observed associations. No univariate outliers (>1.5 times the interquartile range) were observed, thus no data were removed, and Pearson Correlations were selected. Assumptions for parametric multiple regression models were checked to ensure data suitability for parallel mediation analyses (Rijnhart et al., 2021). Assumptions were met with respect to no multicollinearity indicated by VIF scores <10 (Hair et al., 2014) suggesting low intercorrelation between predictors, independence of residuals indicated by Durbin-Watson values ~2 (Draper & Smith, 1998) suggesting no autocorrelation, and no influential cases biasing the models indicated by Cook's distance <1 (Cook & Weisberg, 1982). Homoscedasticity was tested using Spearman correlations between standardized predicted values and standardized absolute residuals. Homoscedasticity was met for the path model assessing marijuana consequences, indicated by a non-significant correlation ($p = .562$). Homoscedasticity was not met for the path model assessing alcohol consequences, indicated by a significant correlation ($p = .009$), suggesting the residuals were not normally distributed. Heteroskedasticity may increase the likelihood of Type 1 error, thus percentile bootstrapping was applied in each path model to reduce risk of Type 1 error. Percentile bootstrapping is superior to bias-corrected and delta methods in reducing the likelihood of a Type 1 error, providing better coverage, improving power, and is capable of adjusting for violations of homoscedasticity (Sim et al., 2022). JASP v0.16 software was used to assess the two path models, with 10,000 percentile bootstrapped confidence intervals. Each path model assessed whether the four motives for substance use (coping, conformity, social, enhancement) uniquely mediated the relationship between childhood trauma exposure and substance-related consequences, for alcohol and marijuana separately. Both path models were assessed including covariates of use frequency, gender, and age, and results did not differ. Thus, the following results are not inclusive of covariates. To provide an effect size estimate of the mediation paths, 'mediation ratios' were calculated using Preacher and Kelley (2011)'s method. Mediation ratios index the proportion of the relationship between CM and substance problems that is uniquely explained by each of the four substance use motives. The ratio was calculated by dividing the unstandardized indirect path coefficient for each of the four motives by the unstandardized total effect of the model, providing an R^2 value expressing the proportion of variance explained by the indirect effect. The ratio allows for the explanatory power of each indirect path to be directly compared on a standardized scale.

3. Results

3.1. Sample characteristics

As shown in Table 1, the overall sample and substance use subsamples were majority female and the average age was consistently 15 years across subsamples, with the majority of participants being in grades 8 and 9. The most common home (first) language across the sample was isiXhosa followed by English.

3.2. Alcohol use

As indicated in Table 2, positive bivariate associations were observed between CM, alcohol problems, and coping and conformity motives. Associations between social and enhancement motives and CM were not significant, though social and enhancement motives did positively associate with alcohol problems, thus were retained in the mediation model. Overall, associations indicate greater CM was associated with greater endorsement of coping and conformity motives for alcohol use, and greater alcohol use problems. Gender,

Table 3
Summary of indirect pathways tested in key variables for alcohol.

Indirect path	Unstandardized coefficients	Standardized coefficients	Standard error	Confidence interval	R^2 value (%) ^a
X → M1 → Y	0.072	0.132	0.022	0.028 to 0.115	0.375 (37.50)
X → M2 → Y	0.021	0.039	0.010	0.001 to 0.041	0.109 (10.94)
X → M3 → Y	0.002	0.004	0.004	-0.006 to 0.010	0.010 (1.04)
X → M4 → Y	0.015	0.028	0.012	-0.008 to 0.039	0.078 (7.81)

Note. Indirect pathways were tested between childhood maltreatment (X) and alcohol-related problems (Y) through coping motives (M1), conformity motives (M2), social motives (M3) and enhancement motives (M4). The only significant indirect pathways are emboldened, linking childhood maltreatment to alcohol-related problems via coping motives and conformity motives, respectively. a = Mediation ratio, calculated via the unstandardized coefficient divided by the unstandardized total effect (0.192).

Table 4
Bivariate correlations and descriptive statistics of study variables for marijuana use.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	–													
2. Gender ^a	0.15	–												
3. Marijuana use frequency	0.01	–0.02	–											
4. Coping motive	–0.05	–0.06	0.40**	(0.88)										
5. Conformity motive	–0.08	0.02	0.14	0.31**	(0.84)									
6. Social motive	–0.06	–0.06	0.21*	0.58**	0.44**	(0.91)								
7. Enhancement motive	–0.09	–0.18*	0.36**	0.57**	0.27**	0.69**	(0.91)							
8. Emotional abuse	0.05	–0.19*	0.11	0.34**	0.05	0.08	0.21*	(0.82)						
9. Physical abuse	–0.07	–0.10	0.09	0.32**	0.30**	0.25**	0.22*	0.55**	(0.83)					
10. Sexual abuse	0.08	–0.25**	0.06	0.17*	0.07	0.04	0.10	0.53**	0.37**	(0.83)				
11. Emotional neglect	–0.02	0.08	0.16	0.18*	0.11	–0.11	0.00	0.37**	0.18*	0.16	(0.83)			
12. Physical neglect	–0.01	0.09	0.13	0.15	0.21*	0.01	0.03	0.33**	0.20*	0.28**	0.55**	(0.44)		
13. CM (overall)	0.02	–0.13	0.12	0.30**	0.18*	0.04	0.10	0.84**	0.69**	0.69**	0.62**	0.62**	(0.90)	
14. Marijuana problems	0.02	0.01	0.43**	0.46**	0.25**	0.32**	0.32**	0.22**	0.22**	0.11	0.19*	0.31**	0.29**	(0.85)
Mean	15.11	1.38	1.74	11.99	5.90	10.19	13.40	11.99	9.66	8.74	11.17	7.38	48.96	3.93
SD	0.93	0.69	1.03	6.29	2.75	5.81	6.52	6.10	5.44	5.29	5.46	2.96	18.00	3.82
Range	14–17	F/M (96/34)	1–4	3–25	0–21	2–25	3–25	4–25	4–25	4–25	3–25	2–19	2–102	0–21

Note. a = Gender ratio was reported to two categories for gender, due to no sufficient data ($N = 6$) in the categories of “I identify as neither or as both” or “Prefer not to say”. Males are the reference category.

All unadjusted values significance indicated by * = $p < .05$, ** $p \leq 0.01$ *** $p \leq 0.001$.

Values in emboldened remained significant following Bonferroni corrections ($p < .003$). Cronbach Alpha reported in the diagonal of the table.

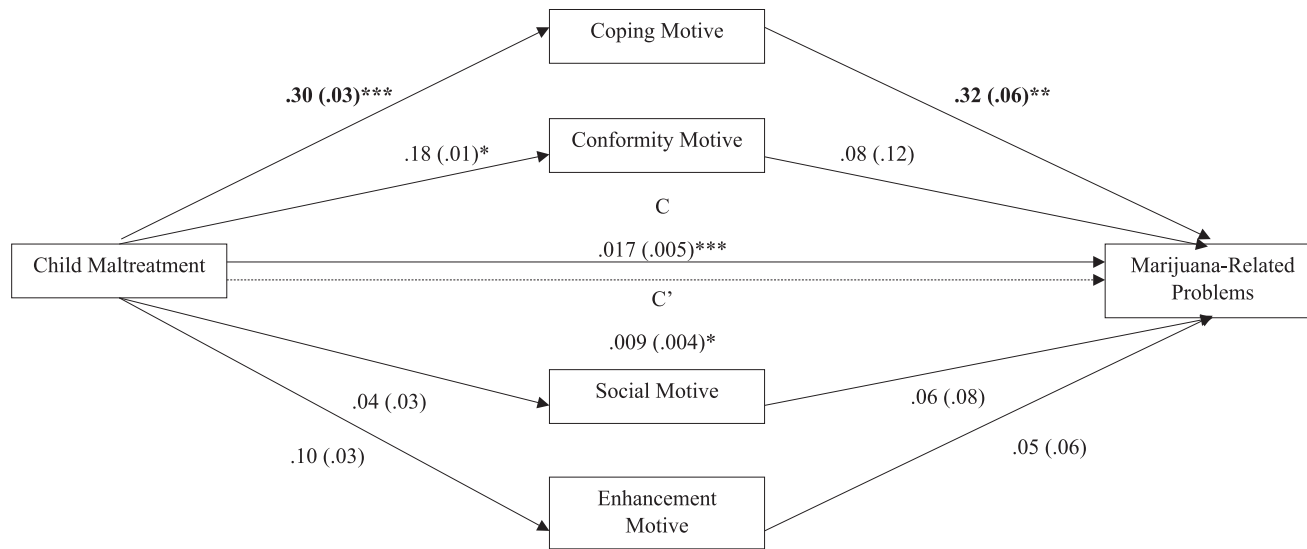


Fig. 2. SEM mediation path model for marijuana use ($N = 136$). For each connecting line, the standardized beta value between the two variables is shown. The 10,000-percentile bootstrapped standard error of each beta value is shown in brackets. Significant beta values are labelled as $*p < .05$, $**p < .01$, $***p < .001$. Only coping motives partially mediate the relationship between childhood maltreatment and marijuana related problems, accounting for 34.43 % of total effects.

age and alcohol use frequency did not significantly correlate with any of the four coping motives, CM, nor alcohol problems. The Bonferroni correction for multiple testing was conducted to adjust the p -values of the bivariate associations to reduce risk of type 1 error for multiple tests (Armstrong, 2014) (p -value adjusted to $0.05/14 = 0.0035$).

Fig. 1 shows the path model. Both the total effect (C path) and direct effect (C' path) between CM and alcohol-related problems were significant. Additionally, a significant indirect effect linked CM and alcohol-related problems through coping and conformity motives. Mediation ratios show coping motives accounted for 37.50 % of total effects, and conformity motives accounted for 10.94 % of total effects, as detailed in Table 3. By contrast, neither social nor enhancement motives were significant indirect paths. These findings indicate a partial mediation effect of coping and conformity motives, with coping accounting for more variance than conformity between CM and alcohol-related problems. Thus, the relationship between CM and alcohol-related problems is partially accounted for by endorsement of coping and conformity motives.

3.3. Marijuana use

As indicated in Table 4, positive bivariate associations were observed between CM, marijuana problems and coping motives. Associations between social, conformity and enhancement motives and CM were not significant, though social, conformity and enhancement motives did positively associate with marijuana problems, thus were retained in the mediation model. Overall, associations indicate greater CM was associated with greater endorsement of coping motives for marijuana use, and greater marijuana problems. Gender, age, and marijuana use frequency did not significantly correlate with any of the four coping motives, CM, nor marijuana problems. The Bonferroni correction for multiple testing was conducted to adjust the p -values of the bivariate associations to reduce risk of type 1 error for multiple tests (Armstrong, 2014) (p -value adjusted to $0.05/14 = 0.0035$).

Fig. 2 shows the path model. Both the total effect (C path) and direct effect (C' path) between CM and marijuana-related problems were significant. Additionally, there was a significant indirect effect linking CM and marijuana-related problems through coping motives. The mediation ratio showed coping motives account for 34.43 % of the total effect, as detailed in Table 5. By contrast conformity, social, and enhancement motives were not significant indirect paths. These findings indicate a partial mediation effect of coping motives between CM and marijuana-related problems. Thus, the relationship between CM and marijuana-related problems is partially accounted for by endorsement of coping motives.

4. Discussion

Coping motives have been found to mediate the risk pathway between CM and PSU in adults in Western countries (e.g. Mezquita et al., 2014; Shin et al., 2020), but the developmental and cross-cultural stability of this pathway is unclear. The current study found that coping motives mediate a substantial proportion of the relationships between CM and both alcohol and marijuana problems in a young (average 15-year-old) sample of South African adolescents who have used these substances. In addition, conformity motives played a smaller mediating role for alcohol problems, and no mediating role for marijuana problems. Finally, enhancement and social motives played no mediating role between CM and either alcohol or marijuana problems. The fact that these findings were obtained with parallel mediation models which included all four motives indicates that specific beliefs that substances help cope with negative affect uniquely mediated the greatest proportion of variance in substance problems in CM-exposed adolescents, distinct from general beliefs about the utility of substances. This corroborates related observations in young adults (Mezquita et al., 2014; Shin et al., 2020; Shuai, Anker, et al., 2022; Vilhena-Churchill & Goldstein, 2014), suggesting that coping motives play a key role in mediating greater substance-related problems across age and country strata. Further, our findings indicate that coping motives are key to understanding both alcohol and marijuana use problems in adolescents.

The stress-coping model posits that individuals tend to engage in either emotion focused coping (trying to manage one's emotional responses to stress) or problem-focused coping (taking steps to alter the problem that is causing stress) (Lazarus & Folkman, 1984). Within this model, using substances to cope can be conceptualised as an emotion focused strategy for avoiding or disengaging from negative feelings. Previous research has found that general avoidant or disengaged coping styles (McConnell et al., 2014), and the specific strategy of using substances to avoid negative feelings (Blevins et al., 2016; Kuntsche & Müller, 2011; Wicki et al., 2017), are associated with an increased risk of substance use in general adolescent samples. Our findings indicate that attempting to avoid negative affects through the use of substances also plays a critical part in the risk pathway between childhood maltreatment and

Table 5
Summary of indirect pathways tested in key variables for marijuana.

Indirect Path	Unstandardized coefficients	Standardized coefficients	Standard error	Confidence interval	R ² value (%) ^a
X → M1 → Y	0.021	0.098	0.009	0.004 to 0.037	0.344 (34.43)
X → M2 → Y	0.001	0.005	0.003	-0.004 to 0.006	0.016 (1.64)
X → M3 → Y	0.003	0.014	0.004	-0.004 to 0.010	0.049 (4.92)
X → M4 → Y	0.00047	0.002	0.001	-0.002 to 0.003	0.007 (0.77)

Note. Indirect pathways were tested between childhood maltreatment (X) and marijuana-related problems (Y) through coping motives (M1), conformity motives (M2), social motives (M3) and enhancement motives (M4). The only significant indirect pathway is emboldened, linking childhood maltreatment to marijuana-related problems via coping motives. a = Mediation ratio, calculated via the unstandardized coefficient divided by the unstandardized total effect (0.061).

adolescent substance use. Understanding why maltreated adolescents use substances to avoid negative feelings, rather than using more problem focused strategies, requires consideration of the broader context of CM. CM is more likely to occur in contexts of multiple adversity and socioeconomic inequity (Hunter & Flores, 2021). It has been suggested that the use of avoidant coping strategies may be functional and adaptive for youth living in such contexts, where stressors cannot easily be problem-solved (So et al., 2017; Wadsworth, 2015). While this may be true for certain avoidance strategies (such as cognitive distraction or behavioural avoidance of risky situations), our findings suggest that using substances to avoid feelings of distress or anxiety is a maladaptive coping strategy for maltreated adolescents, increasing risk for problematic substance use. Further, using substances to cope might actually increase problems or stressors (for example, by negatively affecting school performance and social relationships), which then motivates further drinking. This could create a vicious cycle, leading to progressively worsening substance use problems over time.

The implications for future work to address this risk pathway are as follows. Coping motives should be specifically screened and distinguished from other motives in future cross-sectional and longitudinal epidemiological studies, so the magnitude of risk conferred by coping beliefs can be established. Interventions targeting coping motives have been shown to reduce substance use in adult samples (Anker et al., 2016). Our findings indicate that alcohol and marijuana prevention and intervention programs for adolescents with histories of CM should also consider targeting coping motives. Such interventions should focus on developing more adaptive coping strategies. These should include problem-focused strategies as well as adaptive emotion-focused strategies such as cognitive reframing and seeking social support (Wadsworth, 2015). Finally, regulators should consider combatting alcohol industry marketing, and other forms of ideological manipulation or transfer, which encourage the (arguably false) normative belief that alcohol can relieve negative emotions, especially if these campaigns are targeted at youth groups (Padon et al., 2018).

An explanation is needed for why coping motives, compared to other motives, are so dominant in mediating substance problems in CM exposed adolescents. One must first explain why CM exposed individuals favour alcohol and marijuana as a coping strategy, compared to non-CM individuals. While adolescence is generally a period of high emotional reactivity and increased risk for mental health difficulties (Ahmed et al., 2015), these responses are even more common in adolescents who have a history of maltreatment (Heleniak et al., 2016). Further, poor emotional regulation is characteristic of adolescence (Cracco et al., 2017), but is even further impaired in adolescents who have been maltreated, due to persistent emotional unresponsiveness and the modelling of maladaptive coping strategies by caregivers (Cicchetti & Handley, 2019; Dvir et al., 2014; Kim & Cicchetti, 2010; Weissman et al., 2019). This might leave room for maladaptive substance use coping strategies to develop in the behavioural repertoire. Several observations are consistent with this claim. First, Norton et al. (2023) found that CM exposed university students reported greater distress intolerance and confirmed a serial indirect path linking childhood maltreatment to alcohol problems through distress intolerance and drinking to cope in turn. Individuals who are low in distress tolerance are driven to quickly avoid or escape negative emotions, for example through substance use, as they lack a more adaptive coping repertoire. Second, Kleim et al. (2014) found that trauma survivors report less specific positive future goals, which in turn, has been shown to be associated with greater substance use coping motives (Shuai et al., 2023). This suggests that reduced access to adaptive coping strategies (such as investing in future goals) might confer risk of developing substance use coping motives. Finally, Witkiewitz et al. (2018) found that a broad adaptive coping repertoire mediated the reduction in drinking problems following behavioural therapy, suggesting that a broad adaptive repertoire is protective. Overall, failure to develop adaptive ways to manage negative affect may be a key factor driving coping motives among CM exposed adolescents.

An explanation is also required for why coping motives are then associated with greater substance use problems. It is important to note that CM exposed individuals did not report consuming alcohol or marijuana more frequently than non-CM exposed individuals, but they selectively reported more substance problems. Moreover, the indirect path linking childhood maltreatment to substance problems through coping motives was not changed by the inclusion of substance use frequency as a covariate, suggesting that consumption frequency plays no role in this indirect path. The finding that coping motives confers risk of substance problems without increasing consumption frequency is known as the 'harm paradox' (Boyd et al., 2022). Specifically, individuals who experience economic adversity, have mental health problems, or report coping motives, suffer more substance related harms despite comparable consumption levels to reference groups (Anker et al., 2023; Boyd et al., 2022; Bresin & Mekawi, 2021; Shuai, Bravo, et al., 2022). It appears, therefore, that the CM exposed adolescents in our sample experience the substance harm paradox – more problems for comparable consumption – as a result of having adopted substance coping motives into their repertoire. The reasons for more substance problems for comparable consumption need to be further explored. One possibility is that CM exposed individuals are subject to a wide spectrum of accumulated adversity, including poor mental health, economic deprivation, and educational challenges (Chang et al., 2019; Crouch et al., 2019; Walsh et al., 2019). When CM exposed individuals consume alcohol or cannabis as a way to cope with these adversities (instead of engaging in more adaptive coping strategies), intoxication might exacerbate these existing problems, or create new synergistic problems, leading to greater endorsement of substance problems in the questionnaires. To give a concrete example, two of the substance problems items were: "Had a fight, argument or bad feeling with a family member" and "The quality of my work or schoolwork has suffered". It is plausible that if CM individuals have pre-existing problems in family relations and school (in these examples), engagement in substance use to cope with negative feelings in this particular context would be especially likely to engender further problems. In short, greater substance problems in CM exposed individuals may arise from the pre-existing problematic contexts in which substance use is taking place.

These two explanations can be synthesized to explain the full indirect path linking childhood maltreatment to substance problems through coping motives. In this view, the total developmental experience accompanying childhood maltreatment results in these individuals having a poorer repertoire of adaptive coping strategies, leaving room for the development of maladaptive substance use coping motives. These coping motives do not necessarily lead to greater substance use frequency, but when substances are used to cope, this may often occur in a pre-existing problematic context which is likely to be further exacerbated by substance use, resulting in more substance use problems for comparable consumption. However, this proposal is speculative and in need of further investigation,

ideally through longitudinal research. It might be further speculated that the non-Western CM youth in our sample are uniquely exposed to this risk pathway. High rates of CM in South Africa may initiate the risk, and economic deprivation and poor education quality may then impede the development of adaptive coping strategies for managing the negative emotions arising from living in a context of CM. Notionally, these factors could strengthen the risk pathway in lower income contexts such as South Africa but given there are only two studies in non-Western samples (the present study and Hogarth et al., 2019), more cross-cultural research is needed to substantiate this proposal.

In our South African adolescent sample, conformity motives also played a significant mediating role for alcohol problems, although smaller than that for coping motives. This is in contrast to Western young adult samples, where conformity motives played no apparent mediating role between CM and substance-related problems (Mezquita et al., 2014; Shin et al., 2020; Vilhena-Churchill & Goldstein, 2014). Adolescence is a period of special vulnerability to peer influences (Laursen & Veenstra, 2021), and the need for peer acceptance and belonging may be particularly acute for adolescents with histories of maltreatment and dysfunctional family contexts. This need for peer approval may drive engagement in behaviours such as driving while intoxicated, spending too much money on alcohol, or going to school intoxicated, compounding the risk for problematic alcohol-related outcomes. However, this mediating role of conformity motives was not replicated for marijuana, raising the intriguing possibility that alcohol and marijuana problems arise from different risk processes in CM youth. For example, solitary use of marijuana is more common than solitary use of alcohol in adolescence (Terry-McElrath et al., 2022; Tucker et al., 2014), so marijuana use may entail fewer pressures to conform. Indeed, in our sample, there were fewer marijuana users ($n = 136$) than alcohol users ($n = 180$) and so there may be less peer pressure to consume marijuana. Such theorising, however, may be premature as the difference between drug classes was descriptive. Statistical contrast of the path coefficients from the two models was not conducted as the sample size was too small to allow meaningful comparison. Therefore, the difference between drug classes warrants testing in future research, and if replicated with a larger sample, could open a fruitful avenue for a more fine-grained theory of substance problems in CM youth. For now, given the absence of replication, the importance of conformity motives in substance problems for CM youth remains an intriguing open question.

It is important to note that we found only partial mediation effects, with only 37.50 % and 10.94 % of the relationship between CM and alcohol problems explained by coping and conformity motives respectively, and only 34.43 % of the relationship between CM and marijuana problems explained by coping motives. The remaining unexplained variance could be due to noise in the existing questionnaire measures, which could potentially be improved upon, for example, by coping motives addressing sample-specific forms of trauma (Hawn et al., 2020). Alternatively, measurement of additional constructs could explain further risk. For example, resilience at both structural (i.e., environmental resilience) and trait levels (Watters et al., 2023), emotion regulation capacities (Gruhn & Compas, 2020) or self-concept (Lu et al., 2017) might have protected some individuals from the consequences of childhood maltreatment (Watters et al., 2023). If coping motives only partially mediate risk, and other constructs also play a role, then interventions which only target coping motives can only hope to achieve partial efficacy, and intervention might need to address other risk variables to produce better outcomes. At the very least, the present study helps justify future research to build a fuller account of risk in CM exposed individuals, to guide complex intervention development.

Several limitations of this study are noteworthy. First, the cross-sectional design means that inferences about temporal or causal order of the variables in the mediation models cannot be directly deduced from the data itself but were imposed on the data by our prior theorising. Our data only reveal the incremental predictive validity with which one variable predicts another, rather than the temporal order of those variables in the developmental experience of our participants. Consequently, longitudinal designs incorporating these variables to assess their true temporal order over development is essential to test the risk pathways proposed here (Rohrer et al., 2022). Second, our small sample size means that the results need to be replicated with a larger sample, which would also allow comparison of indirect pathways between males and females, between ethnic groups, and between users of different drug classes, and polysubstance users, to explore whether the mediating pathways are comparable. The study relied on a convenience sample of high school learners from specific government high schools in Cape Town, South Africa, which limits the generalizability of findings to a broader population of adolescents with varying backgrounds, socioeconomic statuses, and educational settings. In addition, this research excluded participants who reported never using alcohol or marijuana, potentially leading to the exclusion of a subgroup that could offer valuable insights into protective factors against substance problems. Finally, the use of self-report measures for both predictor and outcome variables might introduce common method variance, potentially inflating the relationships between variables.

5. Conclusion

We found that coping motives were the strongest mediator of the relationship between CM and substance problems in a sample of South African adolescents, distinct from other motives for using substances. This suggests that specific beliefs in the affect-regulating function of substances underpins risk in this group. The key contribution to the literature is the demonstration of the specificity of this indirect substance motive pathway in such a young cohort. Further, our findings demonstrate the importance of coping motives as a mediator in a non-Western cultural group, supporting the cross-cultural generality of this mechanism (see Norton et al., 2023). Replication in other non-Western contexts would provide further confirmation for coping motives as a general theoretical account of the relationship between CM and substance-related problems in adolescence. In addition, conformity motives played a mediating role for alcohol but not marijuana, raising the intriguing possibility that mediating pathways may differ meaningfully between drug classes, but this needs confirmation in future research. However, the dominance of coping motives as a mediator suggests these beliefs should be the focus of screening and intervention for high-risk adolescent samples. Finally, identifying moderating factors that attenuate the pathway between CM, coping motives and substance use, such as social support or school connectedness, could also help to refine prevention strategies.

CRedit authorship contribution statement

Ayesha Assim: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Debra Kaminer:** Writing – review & editing, Writing – original draft, Supervision, Funding acquisition, Conceptualization. **Lee Hogarth:** Writing – review & editing, Writing – original draft, Supervision, Software, Formal analysis, Data curation. **Bella Magner-Parsons:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Soraya Seedat:** Writing – review & editing, Conceptualization.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

Acknowledgments

This work is based on research supported in part by the National Research Foundation of South Africa (Grant no. 120826). Opinions expressed and conclusions arrived at are those of the authors. The funder was not involved in study design, data collection or analysis, writing of the report or the decision to submit the article for publication.

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