Associations Between Coping and Marijuana Use in a Nationally Representative Sample of Adolescents in the United States

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Abstract

Maladaptive coping strategies have been linked with substance use. Little is known, however, about associations between coping and marijuana use in the general U.S. adolescents. We used nationally representative data to examine associations between coping and marijuana use among U.S. adolescents. We hypothesized that marijuana use would be positively associated with both avoidance and distraction coping and negatively associated with problem solving. We calculated adjusted prevalence ratios and odds ratios to assess associations of three coping styles (avoidance, distraction, problem solving) and six coping profiles based on combinations of the styles (adaptive, low on all styles, distracted, high on all styles, avoidant, maladaptive) with lifetime marijuana use and past 12-month frequency of use using data from the National Comorbidity Survey: Adolescent Supplement (n=8,476, ages 14–18 years). Avoidance and distraction coping were positively and problem solving was negatively associated with lifetime marijuana use. Avoidance coping was positively associated, and problem solving negatively associated, with past 12-month frequency of use. Compared to the adaptive coping profile (low avoidance and distraction, high problem solving), maladaptive profile (high avoidance and distraction, low problem solving) and avoidance profile (high avoidance, low distraction and problem solving) were each positively associated with lifetime marijuana use and past 12-month frequency of use. Avoidance coping, especially in combination with limited problem solving, was positively associated with lifetime marijuana use and past 12-month frequency of use. Our findings have potential to inform interventions for reducing adolescent marijuana use.

Keywords

Contributors and Conflicts of Interest: The authors declare that they have no conflict of interest.

Informed Consent: The present study is based on a secondary data analysis, using the National Comorbidity Survey: Adolescent Supplement (NCS-A). We received authorization to access the restricted, de-identified NCS-A data from the Interuniversity Consortium for Political and Social Research and also obtained university IRB approval for this study.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Regional Ethics Committee in Uppsala) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

1. Introduction

Enhancing our understanding of the association between coping and marijuana use is a key step toward improving primary prevention strategies for marijuana use (Faggiano, Minozzi, Versino, & Buscemi, 2014). Two commonly contrasted styles of coping are emotion-focused and problem-focused coping (Lazarus & Folkman, 1984). Emotion-focused or disengagement coping has been linked with early substance use initiation and continued use, whereas problem-focused or engagement coping is considered protective against substance use (McConnell, Memetovic, & Richardson, 2014; Wills, Sandy, & Yaeger, 2001; Wills, Sandy, Yaeger, Cleary, & Shinar, 2001). Studies have shown that people who relied heavily on avoidance coping and did not often use problem solving strategies reported increased psychological distress and unhealthy behaviors, including substance use (Doron, Thomas-Ollivier, Vachon, & Fortes-Bourbousson, 2013; Doron, Trouillet, Maneveau, Neveu, & Ninot, 2015; Eisenbarth, 2012), whereas those who engaged in problem solving and had low levels of avoidance reported fewer symptoms of maladjustment and increased pro-social competencies (Steele, Cushing, Bender, & Richards, 2008).

Adolescent coping and substance use have been studied in a community (e.g., Wills et al., 2001) and clinical setting (e.g., Siqueira, Diab, Bodian, & Rolnitzky, 2001), but coping has not yet been specifically assessed in association with marijuana use in a nationally representative dataset, which would provide more definitive evidence of an association. We used data from the National Comorbidity Survey: Adolescent Supplement (NCS-A) (Kessler, Avenevoli, Costello, et al., 2009; Kessler, Avenevoli, Green, et al., 2009; Merikangas, Avenevoli, Costello, Koretz, & Kessler, 2009), a cross-sectional, nationally representative study, to identify associations between coping and marijuana use. We characterized coping as three distinct styles (avoidance, distraction, problem solving) and also as six profiles based on combinations of the three styles. We hypothesized that marijuana use would be positively associated with both avoidance and distraction and would be negatively associated with problem solving.

2. Material and methods

2.1 Study Design and Participants

The NCS-A (2001–2004) contains information on prevalence, correlates, and service use patterns for major psychiatric disorders in a sample of 10,148 U.S. adolescents aged 13–18 (Kessler, Avenevoli, Costello, et al., 2009; Kessler, Avenevoli, Green, et al., 2009; Merikangas et al., 2009). We excluded 13 year olds because they reported very low levels of marijuana use, resulting in a study sample of 8,495 adolescents aged 14–18. We received NCS-A data access permission from the Interuniversity Consortium for Political and Social Research and obtained university IRB approval.

2.2 Measures

2.2.1 Marijuana Use—Our dependent variables were self-reported *lifetime marijuana use* (yes: n=2,214, no: n=6,262) and *frequency of marijuana use in the past 12 months* (daily/near daily use, n=380; moderate use, n=410, infrequent use, n=580).

2.2.2 Coping—Our independent variables were coping styles and profiles. The NCS-A's self-reported measure of coping was largely adapted from the Ways of Coping Scale (Folkman & Lazarus, 1980, 1985).

Coping styles: Based on our previous factor analysis that identified three coping styles using polychoric correlations (see Lee-Winn, Townsend, Reinblatt, & Mendelson, 2016), we analyzed the following three styles as continuous independent variables: 1) escape-avoidance (labeled 'avoidance' hereafter), 2) distraction, and 3) problem solving. Sample questions included "when under stress how much would you…?": daydream about how things used to be (avoidance), do things to take your mind off the situation (distraction), and try to analyze the problem and see how to make it better (problem solving).

Coping profiles: Previous cluster analyses of coping profiles identified four coping profiles: adaptive (low avoidance, high problem solving), low (low avoidance and problem solving), high (high avoidance and problem solving), and avoidance (high avoidance, low problem solving) (Doron et al., 2013, 2015; Eisenbarth, 2012; Steele et al., 2008). Only one of these studies (Doron et al., 2015) included distraction coping and did not assess it in the context of coping profiles. We assessed distraction as a coping style and also integrated it within our coping profiles to extend the literature. Because each coping style had different numbers of items and the styles were not normally distributed, we performed a median split to dichotomize each of the three coping styles and combined the resulting categories to create six coping profiles : 1) *adaptive*: low avoidance, low distraction, high problem solving (n=895, reference group), 2) *low on all styles* (labeled "*low*"): low avoidance, distraction, and problem solving (n=2,013), 3) *high on all styles* (labeled "*high*"): high avoidance, distraction, and problem solving (n=808), 4) *distracted*: high distraction, low avoidance, low problem solving (n=1,250), 5) *avoidant*: high avoidance, low distraction, low problem solving (n=1,074), 6) *maladaptive*: high avoidance, high distraction, low problem solving (n=1,289). We analyzed coping profile as a categorical independent variable.

2.2.3. Sociodemographic covariates—The NCS-A collected data on self-reported adolescents' age, gender, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Other), and educational attainment of either parent (less than high school, high school, some college, college graduate).

2.3 Statistical Analyses

We examined descriptive statistics for the sociodemographic variables and calculated their associations with marijuana use behaviors (lifetime, past 12-month frequency of use) using weighted chi-squared tests and with the three coping styles (avoidance, distraction, problem solving) using adjusted Wald tests. We used generalized linear modeling to calculate adjusted prevalence ratios to examine associations between coping and lifetime marijuana use. We used multinomial logistic regression to calculate relative risk ratios to assess associations between coping and the past 12-month frequency of use (daily/near daily and moderate versus infrequent). Our main analyses included three models with the three coping styles as independent variables and one model with the six-category coping profile as our independent variable. These models were estimated separately with lifetime marijuana use

and past 12-month frequency of use as the two dependent variables, for a total of eight models. We controlled for adolescent age, gender, race/ethnicity, and parent education in adjusted analyses. Our statistical significance level was set at $p<0.05$. We applied complex survey weights prior to analyses. Analyses were conducted using Stata 13 (StataCorp, 2013).

3. Results

3.1 Sample characteristics

Older adolescents ($\chi^2=71.63$, $p<0.001$) and those whose parents had not completed college ($\chi^2=10.55$, $p<0.001$) reported more lifetime marijuana use. Boys ($\chi^2=4.98$, $p=0.01$) and those in the "Other" race/ethnicity group ($\chi^2=3.03$, $p=0.03$) reported more past 12-month frequent marijuana use than girls and Whites, respectively.

As presented in Table 1, girls reported higher levels of avoidance (F=123.16, $p<0.001$) and problem solving (F=34.46, $p<0.001$) than boys, whereas boys reported higher levels of distraction than girls (F=49.83, $p<0.001$). Non-Hispanic Blacks and Hispanics reported higher levels of avoidance (F=9.91, $p<0.001$) and distraction (F=17.05, $p<0.001$) as compared to non-Hispanic Whites. Adolescents whose parents did not complete college reported higher levels of avoidance (F=11.75, $p<0.001$) and distraction (F=5.69, $p=0.002$) and lower levels of problem solving (F=20.63, $p<0.001$) than those whose parents had graduated from college. Likelihood of reporting the three coping styles did not differ by age.

3.2 Coping and marijuana use

As displayed in Table 2, in analyses that evaluated the three separate coping styles, the two maladaptive styles (avoidance and distraction) were significantly associated with greater lifetime marijuana use, whereas problem solving—an adaptive coping strategy— was significantly associated with decreased lifetime marijuana use (all $p<0.01$). Adolescents who reported daily/near daily use used more avoidance coping ($p=0.02$) and less problem solving ($p<0.001$) than those who reported infrequent use. Distraction was not significantly associated with past 12-month frequency of marijuana use.

In analyses that evaluated the six coping profiles, adolescents with maladaptive, avoidant, distracted, or high profiles reported significantly higher lifetime marijuana use than those with the adaptive coping profile (all p 0.001). Adolescents with the maladaptive or avoidant (both $p=0.02$) coping profile used marijuana at higher frequencies in the past 12 months as compared with those with the adaptive profile. Adolescents with the low coping profile did not differ significantly from those with the adaptive profile in lifetime marijuana use or past 12-month frequency of use. Coping styles and profiles did not differ between adolescents who used marijuana moderately versus infrequently in the past 12 months.

4. Discussion

We investigated associations of coping with lifetime marijuana use and past 12-month frequency of use. Avoidance coping—analyzed either as a coping style or as a key component of the avoidant and maladaptive profiles—was significantly associated both with higher adolescent lifetime marijuana use and with greater past 12-month frequency of use.

Distraction coping, assessed either as a coping style or profile, was associated with greater lifetime marijuana use but not past 12-month frequency of use. Assessed as a coping style, problem solving was associated with lower lifetime marijuana use and past 12-month frequency of use; however, the "high" coping profile was associated with higher lifetime marijuana use.

We observed that avoidance coping, especially in combination with low problem solving, was linked with higher lifetime use and more frequent use of marijuana among adolescents. This finding is consistent with prior research on associations of coping styles (McConnell et al., 2014) and coping profiles (Doron et al., 2013, 2015; Eisenbarth, 2012) with stress, depression, anxiety, and substance use. Developing adaptive coping skills during adolescence is vital (McLaughlin, Hatzenbuehler, Mennin & Nolen-Hoeksema, 2011; Silk et al., 2007; Steinberg & Avenevoli, 2000) because of the substantial effects of positive coping on youths' present and future wellbeing (Broderick & Korteland, 2002; Garcia, 2010; Schonert-Reichl, 2003) and resilience (Compas, Champion & Reeslund, 2005). Avoidance coping is ineffective in the long term because it precludes effective problem solving (Ben-Zur, 2009) and results in increased negative moods (Carver & Connor-Smith, 2010; Najmi & Wegner, 2008). Distraction coping can be either adaptive or maladaptive, depending on whether it is used as a temporary strategy to divert attention from stressful stimuli until an active coping strategy such as problem solving can be employed or as a means of escaping stressful stimuli indefinitely (Wolgast & Lundh, 2017). Distraction coping in our study appeared maladaptive, as it was related to higher lifetime marijuana use.

Lifetime prevalence and frequency of marijuana use did not differ between adolescents with the "low" versus adaptive coping profile in our study. While we were not able to directly measure stress levels and their associations with coping, our finding may be consistent with previous research in which adolescents with the "low" coping profile perceived lower levels of stress and may not have felt the need to utilize coping strategies (Doron et al., 2015). In our study, engaging in problem solving in addition to avoidance and distraction coping was not protective against marijuana use, even though problem solving as a distinct coping style was associated with reduced marijuana use. This finding may suggest that the negative effects of avoidance and distraction on marijuana use outweigh the positive or protective effects of problem solving. Consistent with that hypothesis, a meta-analysis on emotion regulation found that, in general, maladaptive strategies were more strongly related to psychopathology than adaptive strategies (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

As the NCS-A data collection was conducted from 2001–2004, our findings do not capture more recent developments in associations between adolescent coping and marijuana use. Measures of the independent and the dependent variables in this study were self-reported. The present study was not designed to support causal inferences about the relationship between coping and marijuana use, as the NCS-A is cross-sectional in design. Our findings are consistent, however, with findings from some intervention studies. Coping Power (Lochman et al., 2012) and Life Skills (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995), evidence-based programs that focus on enhancing problem solving and anger management skills, were effective in decreasing adolescent marijuana use five years post-intervention

(Zonnevylle-Bender, Matthys, Van De Wiel, & Lochman, 2007) and daily polysubstance use including marijuana use (Botvin, Griffin, & Williams, 2015), respectively.

This study underscores the importance of identifying adolescent coping styles and profiles as part of understanding risk for marijuana use. Although healthy coping has the potential to prevent adolescent marijuana use, only a few school-based marijuana prevention programs incorporate strategies to enhance healthy coping (Center for the Application of Prevention Technologies, 2014). As the rapidly evolving marijuana policy landscape may increase youth access to marijuana, we recommend enhancing healthy coping as a universal strategy for prevention of marijuana use. It is also possible that adolescent marijuana use intervention and prevention efforts may benefit from simultaneously decreasing avoidance and distraction while increasing problem solving. For instance, mindfulness-based techniques are increasingly recognized as an effective stress management tool and a transdiagnostic treatment. These techniques emphasize awareness, rather than avoidance, of present-moment reality and thoughtful, rather than impulsive, responses among adolescents (Ciarrochi, Kashdan, Leeson, Heaven, & Jordan, 2011; Tan & Martin, 2016; Tan & Martin, 2013); future experimental research should explore the usefulness of such strategies in preventing marijuana use.

Acknowledgments

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Highlights

- Avoidance coping was associated with higher lifetime and frequency of marijuana use.

- Distraction coping was associated with higher lifetime marijuana use.

- Problem solving was associated with lower lifetime and frequency of marijuana use.

- Avoidance coping combined with low problem solving appeared to be especially maladaptive.

Table 1

Associations of participant characteristics with the three coping styles in the National Comorbidity Survey: Adolescent Supplement (2001–2004)

	Coping Style		
Characteristics	**Avoidance**	**Distraction**	**Problem Solving**
Total, score (SE)	7.9 (0.1)	11.0 (0.1)	8.4 (0.1)
Age			
14	7.6 (0.1)	11.1 (0.1)	8.4 (0.1)
15	7.9 (0.1)	11.1 (0.1)	8.4 (0.1)
16	7.9 (0.1)	11.0 (0.1)	8.4 (0.1)
17–18	8.1 (0.2)	11.0 (0.1)	8.5 (0.1)
Gender			
Female	**8.6 (0.1)**	10.7 (0.1)	**8.7 (0.1)**
Male	7.3 (0.1)	**11.3 (0.1)**	8.2 (0.1)
Race/Ethnicity			
Non-Hispanic White	7.7 (0.1)	10.8 (0.1)	8.5 (0.1)
Non-Hispanic Black	**8.6 (0.2)**	**11.7 (0.1)**	8.4 (0.1)
Hispanic	**8.4 (0.1)**	**11.3 (0.2)**	8.3 (0.1)
Other	7.8 (0.2)	10.8 (0.3)	8.3 (0.2)
Parent education			
Did not complete than high school	**8.5 (0.2)**	**11.3 (0.1)**	**8.0 (0.1)**
Completed high school	**8.1 (0.4)**	**11.3 (0.1)**	**8.3 (0.1)**
Attended college	**7.9 (0.2)**	**11.1 (0.1)**	8.5 (0.1)
College graduate	7.5 (0.1)	10.6 (0.1)	8.7 (0.1)

Note. Adjusted Wald tests were conducted to compare sociodemographic characteristics of participants by coping style. Significant ($p < 0..05$) differences are in bold font.

SE = standard error. Ranges for each style are 0–21, Avoidance; 0–18, Distraction; and 0–12 Problem Solving.

Table 2

Associations of coping styles and profiles with marijuana use in the National Comorbidity Survey: Adolescent Supplement (2001–2004)

	Adolescent Marijuana Use			
	Lifetime Use aPR (95% CI)	Past 12-Month Frequency of Use aOR† (95% CI)		
	Ever (26.5 %) vs. never (73.5%)	Infrequent (43.0%)	Moderate (30.0%)	Daily/near daily (27.0%)
Coping Styles				
Avoidance	1.06*** (1.05, 1.08)	1.00 (ref)	1.04 (0.98, 1.10)	1.07* (1.01, 1.13)
Distraction	1.04** (1.01, 1.06)	1.00 (ref)	0.98 (0.90, 1.08)	0.99 (0.90, 1.07)
Problem Solving	0.94** (0.91, 0.98)	1.00 (ref)	0.93 (0.85, 1.02)	0.86*** (0.80, 0.92)
Coping Profiles				
High problem solving &:				
Low avoidance, low distraction (Adaptive)	---	---	---	---
High avoidance, high distraction (High)	1.62** (1.24, 2.12)	1.00 (ref)	1.64 (0.66, 4.05)	2.36 (0.88, 6.34)
Low problem solving &:				
Low avoidance, low distraction (Low)	1.04 (0.81, 1.34)	1.00 (ref)	1.77 (0.79, 3.94)	2.39 (0.83, 6.87)
Low avoidance, high distraction (Distraction)	1.49** (1.20, 1.85)	1.00 (ref)	1.93 (0.78, 4.77)	2.31 (0.96, 5.56)
High avoidance, low distraction (Avoidance)	1.76*** (1.39, 2.24)	1.00 (ref)	2.47 (0.94, 6.51)	3.45* (1.19, 10.00)
High avoidance, high distraction (Maladaptive)	1.77*** (1.45, 2.15)	1.00 (ref)	1.65 (0.80, 3.41)	3.47* (1.29, 9.33)

Note. CI = confidence interval, aPR = adjusted prevalence ratio, aOR = adjusted odds ratio, regression models were adjusted for age, race/ethnicity, gender, and education attainment of either parent.

Past 12-month frequency of use: Daily/near daily use = nearly every day or 3 to 4 days a week; Moderate use = 1 to 2 days a week or 1 to 3 days a month; Infrequent use = less than once a month.

†Relative risk ratios from multinomial logistic regression interpreted as odds ratios.