THE RELATIONSHIP BETWEEN MENTAL HEALTH SYMPTOMS AND MARIJUANA CONSEQUENCES AMONG LATE ADOLESCENTS IS MEDIATED BY COPING MOTIVES FOR MARIJUANA USE

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TIP

INTRODUCTION

o Marijuana use among adolescents has increasing become a topic of concern as 43.7% of 12th graders reported using marijuana in their lifetime (CDC, 2021) and daily rates of use are near all-time highs.
o As marijuana continues to be legalized across the United States, it is imperative to investigate risk factors and consequences related to adolescent use.
o Previous studies among young adult samples have found that mental health symptoms, including those associated with both depression and anxiety, are significant predictors of increased frequency of marijuana use (Crane, N. A., Langenecker, S. A., & Mermelstein, R. J., 2015, Johnson, K. A., Bonn-Miller, M. O., Leyro, T. M., & Zvolensky, M. J., 2015).
o Little is known however regarding mental health symptoms and marijuana use among adolescents. This risk is particularly salient for adolescents given that many mental health disorders, like depression and anxiety, begin to emerge during this developmental period (Crane, N. A. et al., 2015)., and because earlier of age of marijuana use onset is associated with worse prospective health outcomes (Ford, K. A., Wammes, M., Neufeld, R. W., Mitchell, D., Théberge, J., Williamson, P., & Osuch, E. A., 2014).
o Coping motives for marijuana use (i.e., using marijuana as an external avoidance or escape-based strategy) may serve as a mechanism for some adolescents to avoid distressing anxiety and depressive states (Johnson, K. A. et al., 2009).
o Despite this research, there is a gap regarding the relationship between mental health symptoms (i.e., depression and anxiety) and marijuana use during adolescence.
o This study builds off a previous moderation analysis (Wallace, E. C., Chu, L. H., & Ramirez, J. J., 2020), which found no evidence of moderation suggesting that the relationships between mental health symptoms and marijuana use outcomes do not vary as a function of coping motives. However, it is possible that coping motives may explain, or mediate, any significant relationships between mental health symptoms and marijuana use behavior.
o The aims of the current longitudinal mediation analysis were to:
  1) Examine associations between mental health symptoms, marijuana use, and consequences among adolescents.
  2) Examine coping motives as a mediator between mental health symptoms and marijuana outcomes.

METHODS

Participants and Procedures
o A community sample of late adolescents was recruited from the greater Seattle area predominantly using social media.
o The analytic sample included 107 late adolescents that reported using marijuana in their lifetime (15-18 years old, M_{age} = 17.01, SD_{age} = 0.92, 51% female, 85% White/Caucasian, 60% high school student, 27% college student).
o Participants were asked to complete three online assessments across six months (i.e., Baseline, Month 3, and Month 6 surveys).

Measures
o **Mental Health Symptoms:** Mental health symptoms were assessed with the **Patient Health Questionnaire-4** (PHQ-4; Kroenke, Spitzer, Williams, & Löwe, 2009), which includes the first two items of the PHQ-9 to assess the degree of a depressed mood over the past two weeks, and the first two items of the GAD-7 to assess symptoms of anxiety over the past two weeks.
o **Typical Marijuana Use:** Typical marijuana use over the past three months was assessed with the **Marijuana Daily Questionnaire** (MDQ; Lee, Kilmer, Neighbors, Atkins, Zheng, Walker, & Larimer, 2013) in which participants are asked to report how many hours they were high on each day of a typical week over the past three months.
o **Marijuana Consequences:** Participants reported the frequency of 26 consequences over the past three months that resulted from their marijuana use using the **Marijuana Consequences Questionnaire** (MCQ; Lee, Kilmer, Logan, Walter, Garberson, Neighbors, 2012).
o **Coping Motives:** Participants rated how often 24 different reasons for using marijuana influenced their own use using the **Comprehensive Marijuana Motives Questionnaire** (CMMQ; Lee, Neighbors, Hendershot, Grossbard, 2009). Three items in particular were summed to assess coping motives.

RESULTS

Analytic Plan
o All variables and sample characteristics were examined using SPSS version 27, and the hypothesized regression models were estimated using the PROCESS macro version 3.5.
o Mediation models included mental health symptoms assessed at baseline, coping motives assessed at Month 3, and marijuana use outcomes at Month 6.
o Potential mediated effects were tested using the bootstrap method with 5,000 resamples and standardized 95% confidence intervals (CIs) around the estimates were examined with CIs that do not include zero indicating significant indirect effects.
o Two separate mediation models were fit for predicting 1) typical marijuana use and 2) marijuana-related consequences.

Overall
o Path "a" in both models revealed that mental health symptoms at baseline were significantly and positively associated with using marijuana to cope at Month 3.

Model 1 (Typical Marijuana Use, Figure 1):
o There was no significant total effect of mental health symptoms at baseline on marijuana use at Month 6. This finding replicates our prior cross-sectional examination at Baseline demonstrating no relationship between mental health symptoms and levels of marijuana use among adolescents (Wallace, E. C., Chu, L. H., & Ramirez, J. J., 2020).

Model 2 (Marijuana-Related Negative Consequences, Figure 2):
o For the second model, motives at Month 3 fully mediated the relationship between mental health symptoms at baseline and marijuana-related consequences at Month 6 (path c). That is, there was a significant total effect of mental health symptoms at baseline on marijuana consequences at Month 6.
o There was also a significant indirect effect such that mental health symptoms were associated with greater coping motives at Month 3 (path a), and greater coping motives were associated with more marijuana-related consequences at Month 6 (path b). When accounting for the significant indirect effect, the direct effect of mental health symptoms on marijuana-related consequences was no longer significant (path c').

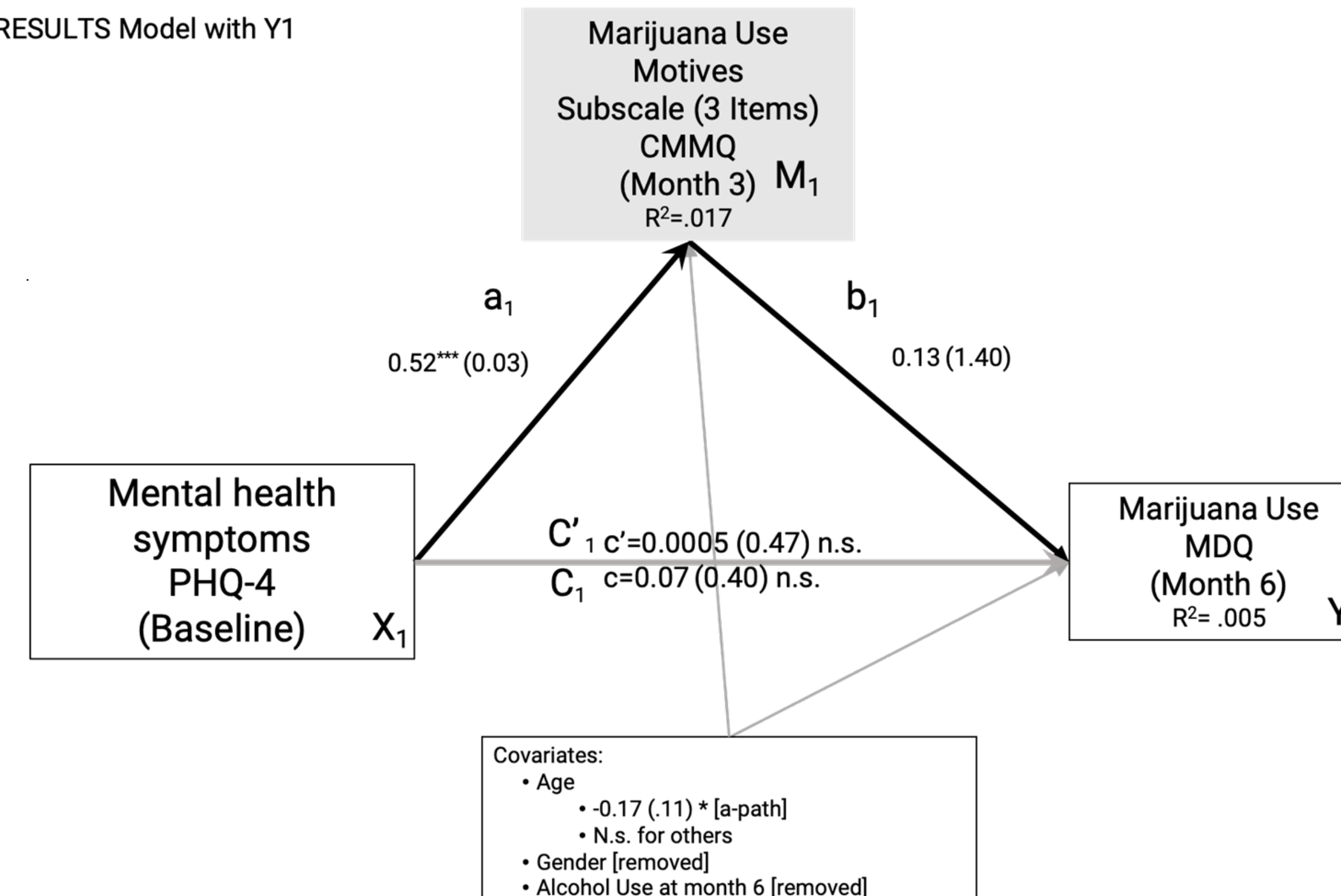Fig.1 Multiple mediator model. Paths a, b, and c' are OLS regression coefficients in standardized form. Path c' represents the effect of x on y when M is included as a mediator. Path c represents the effect of x on y when M is not included as a mediator. *p<.05, **p<.01, ***<.001.
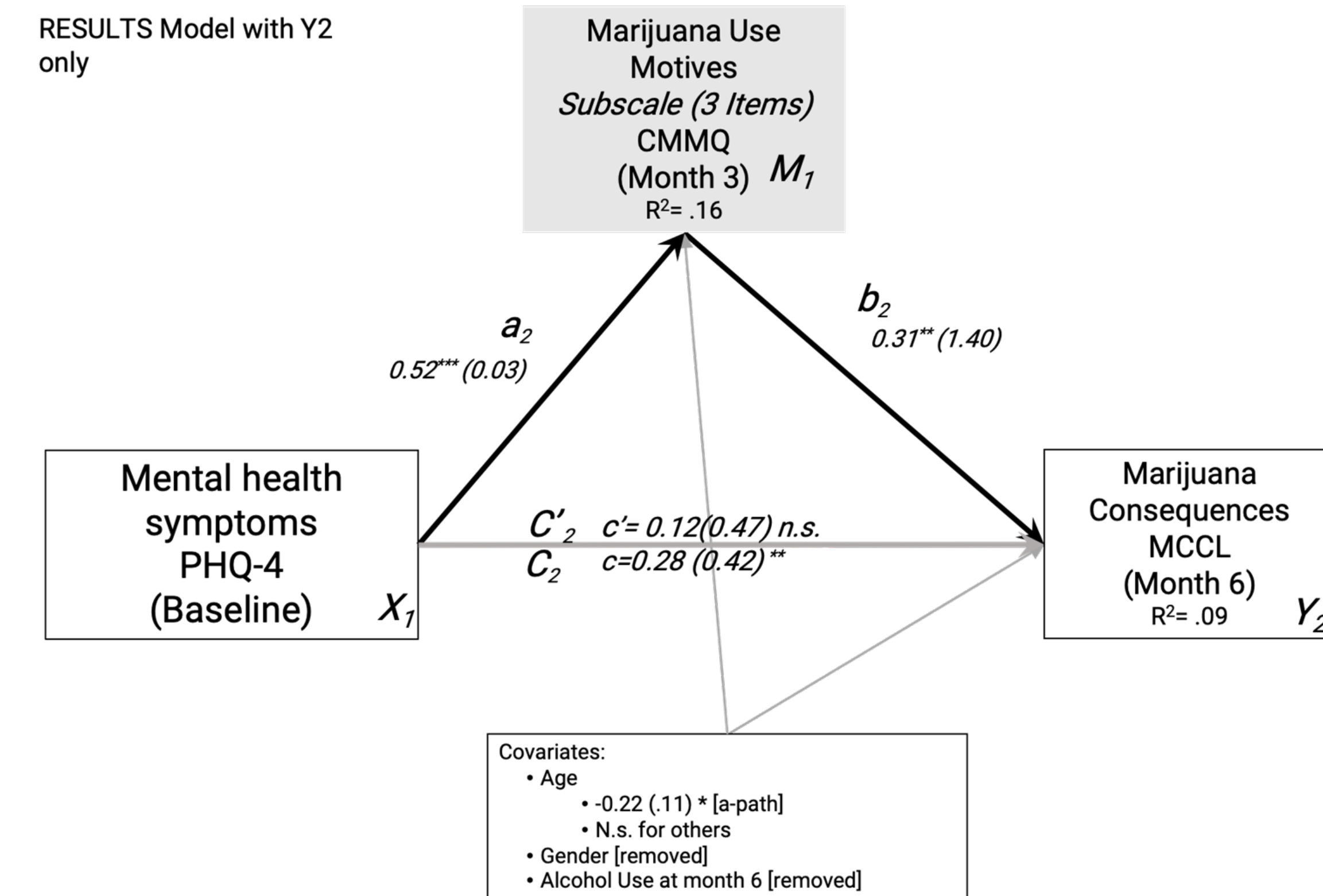
Fig.2 Multiple mediator model. Paths *a, b,* and *c* are OLS regression coefficients in standardized form. Path *c'* represents the effect of x on y when M is included as a mediator. Path *c* represents the effect of x on y when M is not included as a mediator. *p<.05, **p<.01, ***<.001.

DISCUSSION

o Our results suggest that adolescents who experience more mental health symptoms do not use marijuana more than others who report fewer symptoms. However, these individuals may be at greater risk for experiencing negative consequences that result from their use.
o Further, results also suggest that the relationship between mental health symptoms and negative consequences may be largely accounted for by stronger motives to use marijuana to cope with mental health symptoms.
o Screening for mental health symptoms during adolescence may be beneficial in preventing negative consequences related to marijuana use. Earlier screening could provide critical interventions to provide healthier coping strategies for anxiety and depression.
o These results indicate a need for the development of psycho-education or personalized feedback trainings for adolescents which demonstrate how using marijuana to cope with mental health symptoms may not be beneficial for mental health and instead is associated with more marijuana related consequences.

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