Published in final edited form as:
Drug Alcohol Depend. 2006 June 9; 83(1): 42–48. doi:10.1016/j.drugalcdep.2005.10.007.

The Marijuana Ladder: Measuring motivation to change marijuana use in incarcerated adolescents

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Abstract

The purpose of this study was to determine if a modified version of the Contemplation Ladder, a measure of motivation to change marijuana use among incarcerated adolescents (Marijuana Ladder; ML), was related to marijuana use and treatment engagement. Participants (N = 122) in this study were all incarcerated at a state juvenile correctional facility in the Northeast. Adolescents were assessed at the beginning of their incarceration, 2 months into their incarceration, and 3 months after their release. There was a significant negative relationship between ML scores and marijuana use and a significant positive relationship between ML scores and treatment engagement. When controlling for prior marijuana use and age, ML scores at baseline significantly added to the prediction of marijuana use and treatment engagement among incarcerated adolescents. Results support the concurrent validity and the predictive validity of the ML. This measure has the potential to provide important information for Juvenile Justice Facilities that might aid in treatment planning and discharge planning for incarcerated adolescents. In addition, researchers may find a quick visual analog measure of motivation to change marijuana use with good psychometric properties useful.

Keywords

Marijuana use; Motivation to change; Adolescents; Juvenile delinquents

1. Introduction

1.1. Background

Most incarcerated adolescents have used marijuana prior to incarceration (95%; Lebeau-Craven et al., 2003), while lifetime prevalence among adolescents has been estimated to be between 25 and 50% (Pirkis et al., 2003). Some evidence suggests that motivation to change marijuana use is relatively low among adolescents (Melnick et al., 1997). Various confrontational approaches (e.g., “Scared Straight”) have generally been unsuccessful in helping adolescents reduce their substance use (Petrosino et al., 2000). Although MI has not yet been investigated with incarcerated youth, several authors have recognized the potential of Motivational Interviewing (MI; Miller and Rollnick, 2002) and brief interventions (Monti et

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al., 2001) as interventions that might increase internal motivation to change behavior and increase treatment readiness among incarcerated adolescents (see Ginsburg et al., 2002).

1.2. The Transtheoretical Model

The Transtheoretical Model (TTM) is a well-researched paradigm for understanding treatment readiness and internal motivation to change behavior (Prochaska and DiClemente, 1983). The TTM has been applied to a number of health-related behaviors including cigarette use, alcohol use, and drug use. This model lays out stages of change that include pre-contemplation, contemplation, preparation, action, and maintenance. Several types of instruments have been designed to measure the stages of change including rating scales (Miller and Tonigan, 1997; McConnaughy et al., 1989), algorithms (Crittenden et al., 1998), and visual analogs (Biener and Abrams, 1991).

1.3. Stage of change measures

Stage algorithms, rating scales (URICA; McConnaughy et al., 1989 & SOCRATES; Miller and Tonigan, 1997), and visual analogs (Contemplation Ladder (CL); Biener and Abrams, 1991) have all been demonstrated to have good concurrent validity when measuring motivation to change substances other than marijuana (i.e., alcohol and cigarettes). Rating scales and visual analogs have been found to have more modest predictive validity (Carey et al., 1999), while there is stronger support for the predictive validity of stage algorithms (Carey et al., 1999).

A recent study of adult smokers comparing the Contemplation Ladder to the URICA (a 28-item rating scale) found “support for the convergent and concurrent validity of these two measures and suggest that the single-item Contemplation Ladder may be a practical alternative to the URICA in certain situations (Amodei and Lamb, 2004, p. 301).” Carey et al. (1999) also stated that the Contemplation Ladder is easy to complete, which might make it more palatable than longer rating scales for some clinicians and clients.

A study of adolescent smokers comparing the Contemplation Ladder, the URICA, and two different stage algorithms found comparable concurrent validity for the Crittenden Algorithm (Crittenden et al., 1998) and the Contemplation Ladder, which was superior to the concurrent validity of the other measures (Stephens et al., 2004). There was also evidence for convergent validity among the Contemplation Ladder and the two stage algorithms. In their review of readiness to change measures, Carey et al. (1999) note that more research is needed to evaluate the “applicability” of the Contemplation Ladder to substances other than cigarettes. Similarly those authors state that “convergent and predictive evidence for the validity of algorithms when used with drug and alcohol abusers has yet to be provided. For this reason, the utility of algorithms regarding alcohol and illicit drug use remains to be established (p. 250).”

Since no evidence exists yet supporting the psychometric properties of stage of change (SOC) measures for marijuana, there is a need to develop valid SOC measures for marijuana. The Contemplation Ladder is an appropriate choice for use with incarcerated adolescents due to its ease of administration.

The Contemplation Ladder (Biener and Abrams, 1991) is an easily administered tool that has promise for use in a clinical setting and with adolescents. It consists of the image of a ladder with 11 “rungs” and 5 anchor statements loosely reflecting the stages of change. The CL was initially designed to measure adult cigarette smokers' motivation to change smoking behavior. A high score on the ladder indicates that the respondent is more interested in behavior change, while a low score on the ladder indicates that the respondent is less interested in behavior change. Biener and Abrams (1991) found that this measure had good concurrent and predictive validity with an adult sample, as evidenced by significant correlations between the ladder and

stated intention to quit smoking (r = .64, $p \leq .001$) and number of previous quit attempts (r = .39, $p \leq .001$), respectively. Furthermore, CL scores significantly predicted later smoking behaviors (β = .13, $p \leq .01$).

1.4. Rationale and hypotheses

The psychometric properties of the CL have been well established (e.g., Biener and Abrams, 1991; Carey et al., 2002; Bluthenthal et al., 2001). However, it has not been studied with incarcerated adolescents or marijuana users. The purpose of this study was to investigate the concurrent and predictive validity of a modified version of the CL intended to measure motivation to change marijuana use (the Marijuana Ladder; ML) in incarcerated adolescents. In order to investigate concurrent and predictive validity, we examined how the ML was related to marijuana use and substance use treatment engagement. We posited that higher motivation to change marijuana use would be negatively related to concurrent and future marijuana use and positively associated with treatment engagement during incarceration.

2. Methods

2.1. Participants

Participants in this study were all incarcerated at a state juvenile correctional facility in the Northeast. Youth in this facility have committed a range of crimes from truancy to murder. Approximately 1000 youths are detained pending adjudication each year at the facility, and around half of those youth are incarcerated for periods ranging from a few weeks to several years. The annual recidivism rate for this facility is 35%. While incarcerated, these youth were involved in both individual and group interventions, as needed, aimed at a variety of problems (e.g., sex-offending, drug dealing, and anger management). Many also attended an 8-week psychoeducational group treatment for substance use/abuse that meets twice per week. More in-depth substance abuse services were available as indicated and weekly 12-step groups were also available. Youth also received medical, dental, and psychiatric services and attend the facility's school. Community religious organizations were involved with youth at the facility. Finally, limited vocational and transitional services were available for these youth.

At the baseline assessment, all 122 participants in this study reported using marijuana during their lifetime. The average age of first marijuana use in this study was 12.39 years (S.D. = 2.28 years, range = 6–17 years old). During the past year 55% of participants met diagnostic criteria for marijuana dependence with tolerance, 12% met criteria for marijuana dependence without tolerance, 21% met criteria for marijuana abuse, and 12% did not meet criteria for any marijuana diagnosis. The median response for number of days marijuana was smoked (frequency) in the 3 months prior to incarceration was 74 days. The median response for number of marijuana joints smoked per week (quantity) prior to incarceration was 27.39 joints. The median response for number of marijuana joints smoked per day marijuana was smoked (intensity) prior to incarceration was 5.53 joints. In the 3 months after incarceration, the median response for number of days marijuana was smoked (frequency), number of marijuana joints smoked per week (quantity), and number of marijuana joints smoked per day marijuana was smoked (intensity) was 18, 3.45, and 3.81, respectively.

At baseline, 63 participants reported using illegal drugs other than marijuana. The average age of first other drug use in this study was 15.03 years (S.D. = 1.80 years, range = 10–18 years old). In the year prior to incarceration, 13 participants reported using cocaine, 4 admitted using methamphetamines, 16 said that they used depressants, 8 reported using narcotics, 1 admitted using inhalants, and 55 said that they used hallucinogens. In the 3 months after incarceration, 2 participants reported using cocaine, 2 admitted using methamphetamines, 1 admitted using

depressants, 1 reported using narcotics, none admitted using inhalants, and 13 said that they used hallucinogens.

One hundred and nine out of the 122 participants in this study participated in standard care substance abuse services during their incarceration. The standard care involved an 8-week group treatment using a psychoeducational format. Programming for this treatment was standardized. We investigated differences between the 109 who participated in standard care and the 13 who did not on all Timeline Follow-back variables and the ML at pre-test. We also compared these groups on teen and social worker reported treatment engagement at 2-month in-facility follow-up. The only significant difference between the groups was marijuana quantity (average number of marijuana joints smoked per week prior to incarceration). As would be expected, those who did not receive standard care substance abuse treatment used a smaller quantity of marijuana before incarceration.

2.2. Procedures

2.2.1. Overview—Participants in this study were assessed as part of their participation in an ongoing randomized clinical trial. Shortly after incarceration (baseline; $N = 122$), adolescents completed an assessment battery. After a teen had been incarcerated for 2 months, he or she participated in a follow-up assessment ($N = 122$). A final follow-up assessment ($N = 122$) was conducted in the community with each teen 3 months after she or he was released from the juvenile correctional facility. Preliminary analyses did not reveal significant differences between groups on outcome variables in the larger clinical trial.

2.2.2. Screening and consent—As soon as adolescents were incarcerated, they were identified by the staff as potential participants if they were between the ages of 14 and 19 years old (inclusive) and if they were to be held at the facility between 4 and 12 months (inclusive). If youth agreed to participate in the study, their legal guardians were approached for consent. Youth and guardians were informed that all information provided would be strictly confidential, except plans for escape, plans to harm self or others, and reports of child abuse. University and Facility Institutional Review Board approval was gained for all procedures.

Adolescents were included in the study if they met any of the following substance use screening criteria: (1) in the year prior to incarceration they (a) used marijuana or drank regularly (at least monthly), or (b) if they drank five or more standard drinks for boys or four or more for girls on any occasion; (2) they used marijuana or drank in the 4 weeks before the offense for which they were incarcerated; or (3) they used marijuana or drank in the 4 weeks before they were incarcerated. Of 161 adolescents approached for the study, 144 met screening criteria and completed our consent procedure. Of those 144, all initially agreed to participate; 2 adolescents subsequently dropped out of the study. At the time of our analyses, six could not be found for follow-up appointments (lost to follow-up assessment) and were not included in analyses. Marijuana use information could not be calculated for 14 adolescents because they lived in a controlled environment before or after incarceration, so those youth were excluded from these analyses. This left a baseline sample size of 122 participants. Between the 122 participants who were included in the final data set and the 22 adolescents who were not included, there were no differences on marijuana use variables or motivation to change marijuana use prior to incarceration.

2.2.3. Community tracking—Multiple sources of contact information were recorded for all participants for the purpose of collecting follow-up data in the community: addresses, telephone numbers, “nicknames,” pager numbers, employer addresses/phone numbers, shifts at work, school addresses/phone numbers, driver's license numbers, case workers (CW), probation officer (PO), and two family members or friends. Participants signed a letter

addressed to the locators, CWs, or POs which explained that they were participating in a research project and that they had given their permission for the CW, PO, or locator to provide project staff with information to locate him/her.

The post-release follow-up was scheduled prior to release. Participants were provided with appointment cards including the date, time, and location of the appointment as well as the telephone number of the staff member whom they could contact with questions or notify if they moved. Research staff made reminder calls 1 week prior to appointments. Reminder letters were mailed in the event that the participant did not have a phone.

2.2.4. Assessments—The baseline assessment involved a 90-min interview conducted by a trained Bachelor's or Master's-level staff member. Interviewers participated in 20 h of training, received individual supervision as needed (usually weekly), and 1 h of group supervision per week. A Ph.D.-level project member periodically performed in vivo observations of assessments, and all assessment data were reviewed by a Ph.D.- or M.A.-level staff member. Participants were given snacks during the baseline assessment and received a 50-dollar gift certificate during the follow-up assessment. Procedures for the follow-up assessments mirrored the procedure for the baseline assessment, except that the battery was shorter (e.g., we did not need to collect demographic data again) and was conducted in the community.

2.3. Measures

2.3.1. Background Questionnaire (BGQ)—Socio-demographic data were gathered at baseline including age, gender, ethnicity, number of school years completed, and parent/guardian educational level.

2.3.2. Timeline Follow-back (TLFB)—Timeline Follow-back is a calendar-based measure that asks participants to recall substance use over a specified time period (Sobell and Sobell, 1992). The TLFB has been shown to have good concurrent validity in measuring marijuana use among conduct-disordered adolescents (Donohue et al., 2004). A 90-day TLFB was collected at both baseline and follow-up. Three TLFB marijuana use variables were computed for this study: (1) marijuana quantity (average number of marijuana joints smoked per week), (2) marijuana frequency (number of days marijuana was smoked), and (3) marijuana intensity (average number of marijuana joints smoked per day marijuana was smoked).

2.3.3. Treatment Participation Questionnaire for incarcerated adolescents (TPQ)—The TPQ (Stein et al., 2004) is a 30-item questionnaire, which asks about teen treatment engagement. The adolescent version consists of 21 items at BL and 26 items at follow-up, whereas the social worker version consists of 15 items. Items reflect attitudes and behaviors towards individual, group and milieu substance treatment. For the adolescent version (TPQT), principle components analyses (PCA) revealed positive (TPQTP) and negative (TPQPN) engagement scales, whereas the social worker PCA revealed a negative engagement scale (TPQM). Items are rated on a Likert scale (1 = disagree strongly to 6 = agree strongly). Sample items from the adolescent versions include, “I think a lot about the good and bad things about substance use” (positive engagement), and “I like to joke in treatment when they begin discussing substance use” (negative engagement). The scales have concurrent, divergent, and predictive validity. Scales of positive and negative engagement have been found to be significantly correlated with criterion variables such as prior treatment experience, unit behavior as rated by guards, and substance use history ($p \leq .01$). Adolescents filled out the TPQT shortly after treatment milieu begins (BL) and again about 2 months into the milieu. Social workers also completed the TPQ after adolescents had been at the facility for about 2 months.

2.3.4. Marijuana Ladder (ML)—The Marijuana Ladder is an adapted version of the Contemplation Ladder (Biener and Abrams, 1991). The instructions for the ML were very similar to the instructions for the CL. The instructions for the Contemplation Ladder were as follows: "Each rung on this ladder represents where various smokers are in their thinking about quitting. Circle the number that best represents where you are now (Biener and Abrams, 1991)". The instructions for the Marijuana Ladder were: "Each rung of this ladder shows where a person might be in thinking about changing their marijuana use. Select the number that best matches where you are now."

The Contemplation Ladder is a visual analog comprised of 11 rungs and 5 anchor statements, representing stages of change. The Marijuana Ladder is a visual analog comprised of 10 rungs, each of which is accompanied by a corresponding statement (see below for items). The Marijuana Ladder was altered so that stages of change would be represented by multiple rungs with a corresponding statement for each rung, and so that the statements would be applicable to adolescents during a time of no access to marijuana.

The ML had 10 rungs (with associated statements) that respondents used to indicate where they are along the stages of change. In this study, the first three response options corresponded with the stage of pre-contemplation: (1) I enjoy using marijuana and have decided never to change it. I have no interest in changing the way that I use marijuana; (2) I never think about changing the way that I use marijuana, and I have no plans to change; and (3) I rarely think about changing my marijuana use, and I have no plans to change it. The fourth, fifth and sixth response options represented the stage of contemplation: (4) I sometimes think about the way that I use marijuana, but I have no plans to change it; (5) I often think about the way that I use marijuana, but I have no plans to change it; and (6) After release I definitely plan to change my marijuana use, but I'm not ready to make any plans about how to change. The seventh and eighth response options represented the stage of preparation: (7) After release I definitely plan to change my marijuana use, and I'm almost ready to make some plans about how to change; and (8) I plan on using marijuana after release. But I'll make some changes, like cutting back on the amount of marijuana that I use. The ninth response option represented the stage of action: (9) I have changed my marijuana use, but I still worry about slipping back, so I need to keep working on the changes I've made. Finally, the tenth response option represented the stage of maintenance: (10) I have changed my marijuana use and will never go back to the way I used marijuana before. Participants completed this measure at baseline, at the 2-month in facility follow-up, and at the 3-month post-release follow-up. The wording of responses on the ML administered at the post-release follow-up assessment differed slightly to reflect participants' access to marijuana.

3. Results

3.1. Data cleaning

Before examining the validity and reliability of the ML, all variables in this study were checked for outliers. There were two TLFB variables, marijuana quantity (number of marijuana joints smoked per week) and marijuana intensity (number of marijuana joints smoked per day that marijuana was smoked) that did not have normal distributions due to outliers on the upper end of the distribution. As a result, outliers were coded as one unit higher than the highest non-outlier data point (Barnett and Lewis, 1978). This recoding brought the skewness and/or kurtosis of these variables within the normal range.

3.2. Descriptive statistics

This sample at baseline was primarily male (88%) and the mean age was 17.1 years (S.D. = 1.1). Thirty percent of the sample at baseline identified as Hispanic, 36% identified as African

American, 29% identified as White, 3% identified as Native American, and 1% identified as other. On average, participants had been previously detained 2.7 times (S.D. = 3.2). The properties of the Marijuana Ladder are described in Table 1.

3.3. Concurrent validity

To investigate concurrent validity, the ML given at baseline was correlated with marijuana use variables measured at baseline. Similarly, the ML given at baseline was correlated with treatment engagement measured at baseline. Next, the ML administered at the post-release follow-up assessment was correlated with marijuana use variables measured post-release. Finally, the ML administered at the 2-month in facility follow-up was correlated with treatment engagement measured at the 2-month in facility follow-up. A Bonferroni correction procedure was used reduce the possibility of Type I error. As shown in Table 2, there were generally significant negative correlations between the ML scores and Timeline Follow-back marijuana use variables at both baseline assessment and at the 3-month post-incarceration follow-up.

As shown in Table 3, there was a significant positive correlation between the ML scores and teen-reported positive engagement in substance use treatment and a significant negative correlation between the ML scores and teen-reported negative engagement in substance use treatment both at baseline and at the second month in facility follow-up. Social worker report of teen treatment engagement was not related to ML scores.

3.4. Predictive validity

The predictive validity of the ML was assessed using six hierarchical multiple regression analyses (three predicting treatment engagement during incarceration and three predicting marijuana use after release), mirroring the method used by Biener and Abrams (1991). For the first set of three regression analyses, the dependent variables were marijuana use variables measured at the 3-month post-release follow-up. For those analyses, age and the corresponding marijuana use variable measured at baseline were entered as predictors on block one and ML score (baseline) was entered on the second block. For the second set of three regression analyses, the dependent variables were treatment engagement variables measured at the 2-month in facility follow-up. For those analyses, age and marijuana use frequency (baseline) were entered as predictors on block one and ML score (baseline) was entered on the second block. We chose to enter a baseline marijuana use variable on block one, instead of baseline treatment engagement, because we were interested in investigating whether or not the ML provided significant information regarding later treatment engagement when controlling for baseline marijuana use. As shown in Table 4, ML scores significantly added to the prediction of treatment engagement during incarceration and marijuana use after release. In most analyses, the ML score was the strongest predictor of future marijuana use and treatment engagement among incarcerated adolescents.

4. Discussion

This study demonstrated that in a sample of incarcerated adolescents, the Marijuana Ladder has good concurrent and predictive validity. Given the ease of administration of the single-item ML and its good concurrent and predictive validity in this study, the ML should be considered a promising tool for measuring motivation to change marijuana use in incarcerated adolescents.

Marijuana use is extremely common among incarcerated youth. A recent study estimates that approximately 95% of incarcerated males have used marijuana (Lebeau-Craven et al., 2003). The Marijuana Ladder can help juvenile justice personnel and treatment providers in identifying which incarcerated adolescents are motivated to change their marijuana use. How

motivated a teen is to change marijuana use might provide valuable information concerning how to intervene with a given teen. For example, adolescents who are maintaining an extended abstinence from marijuana use may benefit from a relapse prevention intervention, while adolescents who have not contemplated changing their marijuana use might benefit from a motivational enhancement approach. In addition, researchers can use this brief, easily administered tool to study motivation to change in marijuana users.

The Marijuana Ladder is potentially useful with any population of marijuana users. Further studies are needed to evaluate whether the results of this study would apply equally well to non-incarcerated adolescents. The language of the Marijuana Ladder is best suited for respondents who have no access to marijuana at the point of assessment. It may therefore generalize to inpatient settings and boot camps where use is temporarily restricted. No studies have investigated differences between adult and adolescent marijuana smokers in motivation to change use. Motivation to change, in general among psychiatric inpatients seems to be similar when comparing adolescents to adults (Greenstein et al., 1999). However, studies are needed to evaluate differences on the ML between adults and adolescents.

Although the results of this study are encouraging, replication is needed to further establish the psychometric properties of this measure. This study has several other limitations. First, 90% of the sample of incarcerated adolescents in this study was male. It is unclear if the results of this study can be generalized to incarcerated teen girls. Second, self-report data of marijuana use and motivation to change among incarcerated adolescents could be inaccurate. It is possible that some adolescents underreported their marijuana use, while other adolescents exaggerated their use and/or their motivation to change. However, self-report marijuana use among adolescents has been found to correspond well with urine testing and collateral reports (Dennis et al., 2002). Third, social worker ratings of treatment engagement were not related to motivation to change marijuana use in this study, but teen ratings of treatment engagement were. It is possible that adolescents were more aware of their engagement processes (both overt and internal) than social workers who could only infer engagement from observations of adolescents. Future studies should investigate this discrepancy by including other informants such as therapists or other group treatment participants. Finally, this study involves a relatively small sample of incarcerated adolescents. Replication is needed to determine the psychometric properties of the ML across juvenile justice facilities and across other facilities in which access is restricted (e.g., inpatient settings).

Despite these limitations, the Marijuana Ladder is a promising measure of motivation to change marijuana use. Its ease of administration is likely to make the ML especially attractive to resource-limited juvenile correctional facilities mandated to provide substance abuse treatment. The Marijuana Ladder has the potential to provide valuable information that can inform both treatment and discharge planning for incarcerated youth. Finally, future studies should evaluate whether or not the ML could be used as a measure of clinically significant change for substance abuse interventions that target motivation to change marijuana use in incarcerated adolescents.

Acknowledgement

This work was supported by a grant from the National Institute on Drug Abuse, RO1, #13375 (PI, Stein) and from a Department of Veteran Affairs Senior Career Research Scientist Award.

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Table 1

Descriptive statistics: means and standard deviations of the Marijuana Ladder at three time points and the percentage of youth who endorsed each stage of change at three time points

	Baseline	**Facility follow-up (3I)**	**Community follow-up (3O)**
Mean (standard deviation)	6.13 (3.13)	6.75 (2.94)	6.57 (3.40)
Pre-contemplation (%)	26.2	18.0	24.6
Contemplation (%)	16.4	15.6	13.9
Preparation (%)	28.7	32.0	22.1
Action (%)	14.8	19.7	10.7
Maintenance (%)	13.9	14.7	28.7

Table 2

Correlations of the ML with Timeline Follow-back marijuana use indices at two different time points

Marijuana Ladder	Marijuana use index	Correlation (*r*)
Baseline	Quantity	−.24*
	Frequency	−.17
	Intensity	−.23*
Three-month follow-up post-release	Quantity	−.54*
	Frequency	−.62*
	Intensity	−.24*

* Significant at $\alpha \leq .01$.

Table 3

Correlations of the ML with teen treatment engagement measures at two different time points

Marijuana Ladder	Treatment engagement	Correlation (*r*)
Baseline	TPQTP	.46*
	TPQTN	−.24*
Two months into incarceration	TPQTP	.32*
	TPQTN	−.26*
	TPQM	−.07

Note: TPQTP: teen's rating of positive treatment engagement; TPQTN: teen's rating of negative treatment engagement; TPQM: social worker's rating of negative treatment engagement.

*Significant at $\alpha \leq .01$.

Table 4

Standardized regression coefficients for predictors of marijuana use after release and treatment engagement 2 months into incarceration

Variable	Marijuana use index			Treatment engagement measure-two months into incarceration		
	Quantity	Frequency	Intensity	TPQTP	TPQTN	TPQM
Block 1						
Age	−.06	−.01	−.06	.19*	−.03	−.17
Baseline marijuana use index	.40**	.34**	.55**	−.13	.21*	−.04
Block 2						
Baseline ML	−.38**	−.41**	−.18*	.30**	−.25**	−.06
R^2 change	.13**	.16**	.03*	.09**	.06**	.00
From Blocks 1 to 2						
R^2-full model	.29**	.27**	.33**	.14**	.11*	.03

Note: TPQTP: teen's rating of positive treatment engagement; TPQTN: teen's rating of negative treatment engagement; TPQM: social worker's rating of negative treatment engagement; R^2: total variance accounted for by the full model; R^2 change: change in the total variance accounted for from block one to the full model.

* $p < .05$.

** $p < .01$.