Published in final edited form as:
J Child Adolesc Subst Abuse. 2008 ; 17(4): 1–17. doi:10.1080/15470650802231861.

Validation of the Marijuana Effect Expectancy Questionnaire-Brief

O. Torrealday, **L. A. R. Stein**, **N. Barnett**, **C. Golembeske**, **R. Lebeau**, **S. M. Colby**, and **P. M. Monti**

O. Torrealday, PhD, is Director, Office of Clinical Services, Juvenile Court of Memphis and Shelby County, Memphis, TN. L. A. R. Stein, PhD, is Assistant Professor, Cancer Prevention Research Center and Psychology Department, University of Rhode Island, Kingston, RI; and Rhode Island Training Institute, Cranston, RI. N. Barnett, PhD, is affiliated with the Department of Psychiatry & Human Behavior, Center for Alcohol & Addiction Studies, Brown University, Providence, RI. C. Golembeske, PhD, is affiliated with the Rhode Island Training School, Cranston, RI. R. Lebeau, MPH, PhD, is affiliated with the Cancer Prevention Research Center, University of Rhode Island, Kingston, RI. S. M. Colby, PhD, is affiliated with the Department of Psychiatry & Human Behavior, Center for Alcohol & Addiction Studies, Brown University, Providence, RI. P. M. Monti, PhD, is affiliated with the Department of Psychiatry & Human Behavior, Center for Alcohol & Addiction Studies, Brown University, Providence, RI; and Providence VA Medical Center, Providence, RI

Abstract

The purpose of this study was to evaluate a brief version of the Marijuana Effect Expectancy Questionnaire (MEEQ; Schafer & Brown, 1991). The original MEEQ was reduced to 6 items (MEEQ-B). Principal component analysis (PCA) was performed and two factors were identified (positive effects and negative effects) accounting for 52.3% of the variance. Internal consistencies (0.42 to 0.60) were slightly lower than those of the original MEEQ. The negative effect expectancy scale correlated with criterion variables that assess marijuana use ($p \leq .05$). This measure is a helpful tool for clinicians to use when assessing youth expectancies. Replication across different samples of adjudicated youth is recommended.

Keywords

Adolescent; incarcerated; marijuana effect expectancies

More than half of high school seniors acknowledge using illicit substances, including marijuana, and approximately 25% admit to using drugs in the past 30 days (U.S. Department of Health and Human Services, 2002). The number of youth starting to use marijuana at younger than 15 years old has grown in the last decade; this is significant because those adolescents who start using at 15 years or younger are 2.5 times more likely than those starting to use marijuana at 18 years or older to have symptoms of dependence in adulthood (Dennis et al., 2002). Marijuana use has increased despite its association with higher rates of mental disorders, health problems, and school problems among youth (Dennis et al., 2002).

Address correspondence to L. A. R. Stein, PhD, Assistant Professor, University of Rhode Island, Cancer Prevention Research Center, Kingston, RI 02881 (LARStein@uri.edu)..

The risk of substance use disorders is also elevated among youth who commit crimes (McClelland, Elkington, Teplin, & Abram, 2004) and are detained (Braithwaite, Conerly, Robillard, Stephens, & Woodring, 2003). Many youth involved in the justice system have a substance use disorder (McClelland, Teplin, & Abram, 2004) and many more regularly use illicit substances, including high rates of marijuana use (95.7%; Lebeau-Craven et al., 2003). McClelland, Elkington et al. (2004) found that marijuana use disorder, alone and/or in addition to alcohol, was the most common substance use disorder among an adolescent detainee population.

The subjective and behavioral effects of drugs are influenced by expectancies (Aarons, Brown, Stice, & Coe, 2001). Expectancy theory indicates that “through learning, the effects, consequences, and contexts of substance use act to motivate future substance use” (Brown, 1993, p. 56). There is considerable evidence that expectations for reinforcement from alcohol use are highly correlated with the commencement and continuation of drinking behavior (Brown, 1993; Katz, Fromme, & D’Amico, 2000). For example, adolescents who expect positive and arousing effects from alcohol use have been found to have earlier initiation of drinking behavior and drink more often and with less moderation than those youth who hold less evident expectancies (Aarons et al., 2001). Moreover, young adults are more likely to drink alcohol and use illicit drugs when they hold strong positive and weak negative expectancies for these behaviors (Aarons et al., 2001; Katz et al., 2000; Schafer & Brown, 1991).

A few scales have been developed to assess effect expectancies for different substances including marijuana, cocaine, and cigarettes. The Marijuana Effect Expectancy Questionnaire (MEEQ; Schafer & Brown, 1991), created for use with adult populations, is the only scale available that assesses marijuana expectancies specifically. The MEEQ consists of 48 items assessing six domains of marijuana effect expectancies (cognitive and behavioral impairment, relaxation and tension reduction, social and sexual facilitation, perceptual and cognitive enhancement, global negative effects, and craving and physical effects).

In their 2001 study using the MEEQ with an adolescent sample, Aarons and colleagues found that marijuana drug effect expectancies could be reliably measured among adolescents, that the MEEQ was suitable for use with adolescents, and that its domains could be generalized to youth. However, the length of the measure precludes its use in many settings. Clinicians working in intensive, fast-paced settings with limited resources may be interested in a briefer marijuana expectancy tool.

The purpose of this study is to describe the psychometric properties of a brief version of the MEEQ that can be used in incarcerated settings. There is a great need for valid assessment tools for use in environments with limited resources. Marijuana abuse is the most frequently cited substance use disorder in delinquent and incarcerated youth (McClelland, Teplin et al., 2004). Therefore, this is an ideal sample on which to develop and validate a brief measure of the MEEQ. The MEEQ-B could be used to assess and challenge youth marijuana effect expectancies during interventions. We will describe component analysis, internal consistencies, scale stability, concurrent validity, and incremental validity data.

METHODS

Participants

The participants in this study were 130 adjudicated youth residing in a state juvenile correctional facility. The youth in the facility were sentenced for committing crimes ranging in severity from truancy to murder. Approximately 1,100 adolescents are detained at this

facility annually. Of these, 500 to 600 of the youth are adjudicated and serve sentences at the facility, which estimates its annual recidivism rate to be 35%. The youth receive both individual and group interventions, as needed, that address a range of problem behaviors (i.e., drug dealing, sex offending, crime reduction, anger management). A large number of youth also participate in an 8-week psychoeducational group treatment for substance use that meets biweekly for one hour. Medical, dental, and psychiatric services are available, and the adolescents attend the facility's school. More in-depth substance use services are available as indicated, and traditional 12-Step groups (i.e.. Alcoholic Anonymous) are also available weekly. Many of the youth in the facility are also involved with community religious organizations. Limited vocational programming and transitional services such as substance use counseling, case management, and mentoring are available for these youth.

The sample was 90% male with a mean age of 17 years. Approximately 35% of the adolescents were African American, 28.5% Hispanic, 30.5% Caucasian, 3.5% Native American, 1% Asian American, and 1.5% identified as other. The youth in this study had been previously detained, on average, 2.92 times (SD = 3.66) prior to their current incarceration. Over the past 12 months, 85.4% of the participants qualified for a marijuana use disorder as measured by the SCID-I module for marijuana abuse and dependence.

Procedures

Screening and Consent—Shortly upon adjudication, eligible youth were identified by the facility staff as potential participants for the study if they met the following criteria: were between 14 and 19 years old, inclusive, and were to serve a 4- to 12-month sentence. If the youth agreed to participate, consent was obtained from the legal guardian or from those adolescents who were younger than 18 years old. The participants and guardians gave permission for the youth's involvement in a larger treatment outcome study, of which the current study is a component. The participants and guardians were informed that all disclosed information would be kept completely confidential with the exceptions of plans to escape, plans to hurt self or others, or reported cases of child abuse.

Participating adolescents were included in the study if they met any of the following substance use screening criteria: (a) in the year prior to incarceration they used marijuana or alcohol at least monthly or they binge drank (≥5 standard drinks for boys; ≥4 for girls); (b) they used marijuana or alcohol in the four weeks prior to committing the offense for which they were adjudicated; or (c) they used marijuana or alcohol in the four weeks prior to their incarceration. The Institutional Review Board approved all of the procedures utilized. Of the 149 youth introduced to the study, 132 met the screening criteria and completed the consent procedure. Of those 132, two teens dropped out of the study prior to completing the initial assessment, leaving 130 adolescents enrolled at baseline.

Assessment—Shortly after adjudication, trained bachelor's- or master's-level staff completed 90-minute interviews. Interviewers participated in approximately 20 hours of training and received one hour of individual and one hour of group supervision weekly. A doctorate-level project member regularly conducted in vivo observations (live observations) and a master's- or doctorate-level project member reviewed all assessment data. Upon completion of the interviews, records were reviewed. Participants were provided with snacks during assessments and were given a $50 gift certificate upon completion of the larger treatment outcome study (of which this study is a part).

Measures

Record Review (RR): In order to enhance honesty, the youth were informed at the start of the assessment that their self-reported marijuana and alcohol use and illegal activity would

be verified by a record review. Facility records include prior charges, as well as clinical/medical, psychosocial, and substance use histories.

Background Questionnaire (BGQ): Sociodemographic information was recorded and included age, gender, race, and age of first marijuana use.

Timeline Follow-Back (TLFB): Timeline follow-back is a calendar-assisted approach that measures participants' recollection of their substance use over a specified period of time (Sobell & Sobell, 1992). It has been used to assess alcohol use (Bardone, Krahn, Goodman, & Searless, 2000; Sobell & Sobell, 1992), drug use (Midanik et al., 1998), smoking (Lewis-Esquerre et al., 2005), binge eating (Bardone et al., 2000), and sexual behavior (Midanik et al., 1998). TLFB has been shown to have excellent reliability (αs = 0.79 to 0.98; Sobell, Maisto, Sobell, Cooper, 1979) and strong content, criterion, and construct validity. A 90-day TLFB measuring marijuana use was collected at baseline.

Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1991): One item from the CES-D, "People were unfriendly," was considered to be conceptually unrelated to marijuana expectancies and was used to examine divergent validity. Response options range from 0 (rarely or none of the time) to 3 (most or all of the time) in the last week.

Structured Clinical Interview for DSM-IV (SCID-I): The diagnostic interview modules for marijuana abuse and dependence were administered (First, Gibbon, Spitzer, & Williams, 1996).

Marijuana Ladder (ML): The ML is a one-item visual analog consisting of 10 rungs, with corresponding statements, that individuals use to specify where they are along the stages of change (Prochaska & DiClemente, 1982): precontemplation (response options 1, 2, and 3), contemplation (response options 4 and 5), preparation (response options 6 and 7), action (response options 8 and 9), and maintenance (response option 10). It has shown to have good concurrent and predictive validity (Slavet et al., 2006). It measures interest in changing marijuana use and is related significantly with reductions in marijuana use after release from incarceration among juveniles (Stein et al, 2004). We reasoned that interest in changing use would correlate positively with higher negative expectancies and that it may correlate negatively with higher positive expectancies. This is similar to a "decisional balance" (see Miller & RoUnick, 2002), whereby persons moving through the stages of change are thought to weigh the good and not so good of current health-related behaviors, such as marijuana use.

Marifuana Effect Expectancy Questionnaire-Brief (MEEQ-B): The original MEEQ (Schafer & Brown, 1991) was reduced to six items (called MEEQ-B; see Appendix). The wording of each item on the MEEQ-B corresponds to the six original scales of the MEEQ: (a) cognitive and behavioral impairment, (b) relaxation and tension reduction, (c) social and sexual facilitation, (d) perceptual and cognitive enhancement, (e) global negative effects, and (f) craving and physical effects. In parentheses for each item, examples are provided that reflect the two questions that loaded most highly on the original scale. Participants rate items using a Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

RESULTS

Data Cleaning

Two TLFB variables were found to have violated distribution assumptions (skewness and kurtosis) due to outliers. As a result, outliers were coded as one unit higher than the highest

non-outlier data point (Barnett & Lewis, 1978). This recoding brought the skewness and/or kurtosis of these variables within the normal range.

Principal Component Analysis and Internal Consistency

Principal component analyses were conducted using parallel analysis (PA) and minimum average partial correlation (MAP) procedures to determine the number of components to retain (Velicer, Eaton, & Fava, 2000). The two-component solution provided by the PA was superiorto the single component solution obtained by the MAP procedure in regard to average loadings, total variance and interpretability. The average loading per item was 0.704 and 52.3% of the total variance was accounted for by the two components. Component loadings are presented in Table 1. Component 1 (MEEQ-B_p) has three items (items 2, 3, 4) and accounts for 28.8% of the variance with Cronbach's $\alpha = 0.60$. Items reflect positive marijuana expectancies (helps a person relax and feel less tense, helps people get along better and can help you feel more sexual, helps a person feel more creative and perceive things differently). The second component (MEEQ-B_n) also has three items (items 1, 5, 6) and accounts for 23.6% of the variance with Cronbach's $\alpha = 0.42$. These items reflect negative expectancies (makes it harder to think and do things, generally has bad effects on a person, and has effects on a person's body and gives a person cravings).

Concurrent and Divergent Validity, and Stability

Table 2 shows the means (M) and standard deviations (SD) of relevant variables. Greater MEEQ-B_n subscale scores were significantly associated with less reported marijuana use and greater motivation for reducing marijuana use, as shown in Table 3. MEEQ-B_p generally did not correlate significantly with marijuana consumption; however, it did correlate negatively with motivation to reduce use. With regard to divergent validity, neither the positive or negatively MEEQ-B scales correlated significantly with the CES-D scale item "People were unfriendly" (r [MEEQ-B_p, CES-D] = 0.101, $p > .05$; r [MEEQ-B_n, CES-D] = 0.140, $p > .05$). In addition, the two scales appear to measure separate and unrelated constructs in that the correlation between them was r (MEEQ-B_p, MEEQ-B_n) = -0.07, $p > .05$. Test-retest stability as measured over a two-month interval for the MEEQ-B_p and MEEQ-B_n were $r = 0.359$ ($p \leq .00l$) and $r = 0.425$ ($p \leq .001$), respectively.

Incremental Validity

To assess the contribution of marijuana expectancies in predicting motivation to change marijuana use over and above age of first marijuana use and marijuana use level, we conducted a series of hierarchical regressions. For the first step, age at first use was entered; on step 2, marijuana use level in the 90 days before incarceration was entered; and on step 3, the MEEQ-B_p was entered. These analyses were repeated with the MEEQ-B_n entered in the third step. As shown in Table 4, the MEEQ-B_p did not provide statistically significant incremental validity beyond the other predictors. However, the MEEQ-B_n did contribute significantly in predicting motivation to reduce marijuana use beyond the other variables ($F_{CH}[1, 121] = 2146$, $p \leq .001$; $\Delta R^2 = 0.140$).

DISCUSSION

Results suggest that the MEEQ-B serves as a brief and useful tool for clinicians in measuring marijuana effect expectancies with an adjudicated adolescent population. Principal component analysis identified two components within the MEEQ-B (positive and negative expectancies). Although these components account for only about 52.3% of the total variance, this figure is comparable to other measures of substance use (see Rogers, Cashel, Johansen, Sewell, & Gonzalez, 1997). Internal consistencies ($\alpha = 0.42$ to 0.60) are slightly lower compared to those of the original MEEQ ($\alpha = 0.59$ to 0.76; Schafer & Brown,

1991). Low Cronbach α can be expected for scales with only three items, but generally scales produced internal consistencies (α ~ 0.50) that are comparable to those of another adolescent expectancy measure: The Alcohol Expectancies Questionnaire—Adolescent (α ranged from 0.47 to 0.82; Brown, Christiansen, & Goldman, 1987).

Stabilities of the MEEQ-B (r = 0.36 and 0.43) were similar to stability indices of the longer MEEQ (r = 0.21 to 0.56; Aarons et al., 2001). We might expect stability indices to be higher had there been no access to treatment during this test-retest period. The MEEQ-B_n was found to be negatively correlated to marijuana use levels, whereas the MEEQ-B_p was generally unrelated to use levels. Both scales demonstrated divergent validity. The MEEQ-B_n was a good predictor of interest in reducing marijuana use, whereas the MEEQ-B_p was unrelated to motivation to change.

Adolescents with greater negative expectancies reported using less marijuana and on a less frequent basis than those with lower negative expectancies. This is consistent with several studies in the adult and adolescent literature. Schafer and Brown (1991) found that adult nonusers endorsed negative expectancies, and among adolescents, Aarons et al. (2001) found that endorsing negative expectancies was associated with cessation of marijuana use. Given that the current sample was incarcerated, it may be that these adolescents experienced a broader range of drug use consequences than found in community samples of youth. Their endorsement of negative expectancies may reflect their history of experienced consequences (Galen & Henderson, 1999). A review of the negative expectancy responses may serve to initiate dialogue with a client regarding the extent to which marijuana use has impacted his life.

Surprisingly, endorsement of positive marijuana effect expectancies (MEEQ-B_p) was unrelated to marijuana use levels. The exception to this was that the MEEQ-B_p was significantly and positively related to number of days smoked in the last three months. A large majority of the sample in this study met criteria for a marijuana use disorder diagnosis. It may be that while positive marijuana expectancies previously contributed to development of marijuana use disorders, current marijuana-related problems have escalated to the point that adolescents are now developing salient negative expectancies and are interested in reducing use. The MEEQ-B_p scale may prove to be a useful tool in settings with adolescents experiencing less serious marijuana-related problems. The significant correlation with number of days smoked in the last three months may be because adolescents more readily recall days smoked as compared to quantities of joints smoked.

This study has several limitations. First, the majority 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 adolescent females or to nonincarcerated samples. Second, self-report data of marijuana use and experiences among adjudicated adolescents could be inaccurate and may be reflective of under- or overreporting. We attempted to minimize purposeful under/overreporting by conducting private interviews, allowing participants to see our certificate of confidentiality, and not reporting results to authorities. Teens appear to report more misbehaviors than their parents report for them and to self-report more marijuana use than is detected in urinalysis (Dennis et al., 2002). However, replication is needed to determine the utility of the MEEQ-B across juvenile justice facilities and across different and larger samples of adjudicated youth. Given the generally high loadings found, we have confidence that the components would replicate during cross-validation (Guadagnoli & Velicer, 1988).

The MEEQ-B is a brief tool for clinicians to use when assessing youth marijuana effect expectancies during interventions. For clinicians using the MEEQ-B to screen adolescents, the higher the score on a scale/component (i.e., MEEQ-B_p and MEEQ-B_n), the higher the

expectancy. We recommend using the average score of a scale/component during interpretation. For example, when looking at the MEEQ-B_n scale, an individual's three Likert responses (ranging in values from 1 to 5) are added and then divided by three. A scale score closer to 5 reflects more potential negative expectancies for marijuana. We recommend that researchers continue to use the longer, original version of the MEEQ due to slightly better as and because the original MEEQ has information on multiple scales that may be of interest. However, for those working in fast-paced juvenile facilities, the MEEQ-B offers a valid and efficient alternative to the longer original MEEQ.

Acknowledgments

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

APPENDIX: MEEQ-B

The following pages contain statements about the effects of marijuana. Answer each statement according to your own personal thoughts, feelings, and beliefs about marijuana. We're interested in what you think about marijuana, not what others might think. Whether or not you've had actual marijuana experience, you should answer in terms of how you think marijuana affects the typical or average user.

Answer according to how much you agree or disagree with each statement

1. Marijuana makes it harder to think and do things (harder to concentrate or understand; slows you down when you move).				
+	+	+	+	+
1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly
2. Marijuana helps a person relax and feel less tense (helps you unwind and feel calm).				
+	+	+	+	+
1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly
3. Marijuana helps people get along better with others and it can help you feel more sexual (talk more; feel more romantic).				
+	+	+	+	+
1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly
4. Marijuana makes a person feel more creative and perceive things differently (music sounds different; things seem more interesting).				
+	+	+	+	+
1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly
5. Marijuana generally has bad effects on a person (you become angry or careless; after feeling high you feel down).				
+	+	+	+	+

1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly

6. Marijuana has effects on a person's body and gives a person cravings (get the munchies/hungry; have a dry mouth; hard to stop laughing).

+	+	+	+	+
1	2	3	4	5
Disagree Strongly	Disagree Somewhat	Uncertain	Agree Somewhat	Agree Strongly

REFERENCES

Aarons GA, Brown SA, Stice E, Coe MT. Psychometric evaluation of the marijuana and stimulant effect expectancy questionnaires for adolescents. Addictive Behaviors. 2001; 26:219–236. [PubMed: 11316378]

Bardone AM, Krahn DD, Goodman BM, Searless JS. Using interactive voice response technology and timeline follow-back methodology in studying binge eating and drinking behavior: Different answers to different forms of the same question? Addictive Behaviors. 2000; 25(1):1–11. [PubMed: 10708315]

Barnett, V.; Lewis, T. Outliers in statistical data. Wiley; New York: 1978.

Braithwaite RL, Conerly RC, Robillard AG, Stephens TT, Woodring T. Alcohol and other drug use among adolescent detainees. Journal of Substance Use. 2003; 8(2):126–131.

Brown SA. Drug effect expectancies and addictive behavior change. Experimental and Clinical Psychopharmacology. 1993; 7(1-4):55–87.

Brown SA, Christiansen BA, Goldman MS. The Alcohol Expectancy Questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. Journal of Studies on Alcohol. 1987; 48:483–491. [PubMed: 3669677]

Dennis M, Titus JC, Diamond G, Donaldson J, Godley SH, Tims FM, et al. The Cannabis Youth Treatment (CYT) experiment: Rationale, study, design and analysis plans. Addiction. 2002; 97(suppl. 1):16–34. [PubMed: 12460126]

First, MB.; Gibbon, M.; Spitzer, RL.; Williams, JBW. User's guide for the Structured Clinical Interview for DSM-IV Axis I disorders: Research version. New York State Psychiatric Institute; New York: 1996.

Galen LW, Henderson MJ. Validation of cocaine and marijuana effect expectancies in a treatment setting. Addictive Behaviors. 1999; 24(5):719–724. [PubMed: 10574312]

Guadagnoli E, Velicer WF. Relation of sample size to the stability of component patterns. Psychological Bulletin. 1988; 103:265–275. [PubMed: 3363047]

Katz EC, Fromme K, D'Amico EJ. Effects of outcome expectancies and personality on young adults' illicit drug use, heavy drinking, and risky sexual behavior. Cognitive Therapy and Research. 2000; 24(1):1–22.

Lebeau-Craven R, Stein LAR, Barnett N, Colby SM, Smith JL, Canto AL. Prevalence of alcohol and rug use in an adolescent training facility. Substance Use & Misuse. 2003; 38(7):825–834. [PubMed: 12801144]

Lewis-Esquerre JM, Colby SM, Tevyaw TO, Eaton CA, Kahler CW, Monti PM. Validation of the timeline follow-back in the assessment of adolescent smoking. Drug and Alcohol Dependence. 2005; 79(1):33–43. [PubMed: 15943942]

McClelland GM, Elkington KS, Teplin LA, Abram KM. Multiple substance use disorders in juvenile detainees. Journal of the American Academy of Child & Adolescent Psychiatry. 2004; 43(10): 1215–1224. [PubMed: 15381888]

McClelland, GM.; Teplin, LA.; Abram, KM.; Office of Juvenile Justice and Delinquency Prevention. Detection and prevalence of substance use among juvenile detainees. Juvenile Justice Bulletin. June. 2004 Retrieved June 9, 2006, from http://www.ncjrs.gov/html/ojjdp/203934/contents.html

Midanik LT, Hines AM, Barrett DC, Paul JP, Crosby GM, Stall RD. Self-reports of alcohol use, drug use and sexual behavior: Expanding the timeline follow-back technique. Journal of Studies on Alcohol. 1998; 59(6):681–689. [PubMed: 9811089]

Miller, WR.; Rollnick, S. Motivational interviewing: Preparing people for change. 2nd ed.. Guilford; New York: 2002.

Prochaska JO, DiClemente CC. Transtheoretical therapy: Toward a more integrative model of change. Psychotherapy: Theory, Research, and Practice. 1982; 19:276–288.

Radloff LS. The use of the center for epidemiological studies depression scale in adolescents and young adults. Journal of Youth and Adolescence. 1991; 20:149–166.

Rogers R, Cashel ML, Johansen J, Sewell KW, Gonzalez C. Evaluation of adolescent offenders with substance abuse: Validation of the SASSI with conduct-disordered youth. Criminal Justice & Behavior. 1997; 24:114–128.

Schafer J, Brown SA. Marijuana and cocaine effect expectancies and drug use patterns. Journal of Consulting and Clinical Psychology. 1991; 59(4):558–565. [PubMed: 1918560]

Slavet J, Stein LAR, Colby SM, Barnett N, Monti PM, Golembeske C, et al. The marijuana ladder: Measuring motivation to change marijuana use in incarcerated adolescents. Drug and Alcohol Dependence. 2006; 83:42–48. [PubMed: 16289930]

Sobell LC, Maisto SA, Sobell MB, Cooper AM. Reliability of alcohol abusers' self-reports of drinking behavior. Behavior Research and Therapy. 1979; 17:157–160.

Sobell, LC.; Sobell, MB. Timeline follow-back: A technique for assessing self-reported alcohol consumption. In: Allen, J.; Litten, RZ., editors. Measuring alcohol consumption: Psychosocial and biological methods. Humana Press; Totowa, NJ: 1992. p. 41-72.

Stein, LAR.; Barnett, N.; Colby, SM.; Golembeske, C.; Miranda, R.; Monti, PM. Preliminary findings of a randomized clinical trial in a juvenile correctional setting. National Institute on Drug Abuse; Rockville, MD: 2004.

U.S. Department of Health and Human Services. Results from the 2001 National household survey on drug abuse: Volume 111. Substance Abuse and Mental Health Services Administration, Office of Applied Studies; Rockville, MD: 2002.

Velicer, W.; Eaton, C.; Fava, J. Construct explication through factor or component analysis. In: Goffm, R.; Helms, E., editors. Problems and solutions in human assessment. Kluwer; Boston: 2000. p. 41-71.

TABLE 1

Component Loadings for the Marijuana Effect Expectancy Questionnaire-Brief (MEEQ-B) Scales (N = 130)

Items	Positive Marijuana Expectancies (MEEQ-B_p)	Negative Marijuana Expectancies (MEEQ-B_n)
1. Cognitive and behavioral impairment	-0.16	**0.72**
2. Relaxation and tension reduction	**0.58**	0.05
3. Social and sexual facilitation	**0.80**	-0.16
4. Perceptual and cognitive enhancement	**0.82**	0.07
5. Global negative effects	-0.05	**0.74**
6. Craving and physical effects	0.22	**0.56**

Note. Loadings on corresponding factors are in bold. MEEQ-B_p = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, positive scale; MEEQ-B_n = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, negative scale.

TABLE 2

Characteristics of Predictor and Outcome Variables

	M	SD
MJ Ladder (motivation)[a]	6.24	3.11
MEEQ-B_n (assessment 1)[b]	3.58	0.80
MEEQ-B_p (assessment 1)[b]	3.96	0.81
MEEQ-B_n (assessment 2)[b]	3.82	0.81
MEEQ-B_p (assessment 2)[b]	3.93	0.69
CES-D item, "people were unfriendly to me"[c]	1.01	1.05
Age first used MJ	12.48	2.19
Average number of joints per week[d]	41.33	43.22
Average number of joints on smoking days[d]	7.77	6.04
Number of days smoked in last 3 months	59.79	33.51
Average number of joints smoked per day[d]	5.90	6.17

Note. MEEQ-B_p = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, positive scale; MEEQ-B_n = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, negative scale. M = Mean; SD = Standard Deviation; MJ = Marijuana.

[a] On a Likert scale from 1 to 10 (10 is most motivated to reduce use).

[b] On a Likert scale from 1 to 5 (5 indicating more of the expectancy).

[c] On a Likert scale from 0 to 3 (3 indicating more agreement that people were unfriendly).

[d] Data were transformed to fit distributional assumptions (see Methods).

TABLE 3

Correlations Between the Positive and Negative Components of MEEQ-B and Marijuana Use and Motivation to Change Use at Baseline

Marijuana Variable	MEEQ-B_p	MEEQ-B_n
Average number of joints per week[a]	0.085	-0.208[†]
Average number of joints on smoking days[b]	0.035	-0.190[**]
Number of days smoked in last 3 months[a]	0.243[*]	-0.246[*]
Average number of joints smoked per day[a]	0.085	-0.208[**]
Motivation to Change Marijuana Use[c]	-0.154[**]	0.416[††]

Note. MEEQ-B_p = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, positive scale; MEEQ-B_n = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, negative scale.

[a] $N = 125$ because this variable calculated only if adolescent had access to marijuana for > 45 days out of 90.

[b] $N = 117$ because this variable calculated only if adolescent smoked in the 3 months before incarceration and only if adolescent had access to marijuana for >45 days out of 90.

[c] $N = 130$.

[*] $p < .005$.

[**] $p < .05$.

[†] $p < .01$.

[††] $p < .001$.

TABLE 4

Hierarchical Regressions for Predictors of Motivation to Change Marijuana Use (N = 125)[a]

Step	R	R^2_{Adj}	ΔR^2	Anova
			MEEQ-B_p	
1) Age first used	0.240	0.050	0.058	F (1, 123) = 7.53, p < .007
2) No. days smoked in last 3 mo.	0.272	0.059	0.016	F(2,122) = 4.86, p < .009 F_{CH}(1, 122) = 2.12, p > .148
3) MEEQ-B_p	0.288	0.060	0.009	F(3, 121) = 3.65, p < .015 F_{CH}(1, 121) = 1.20, p > .276
			MEEQ-B_n	
1) Age first used	0.240	0.050	0.058	F(1, 123) = 7.53, p < .007
2) No. days smoked in last 3 mo.	0.272	0.059	0.016	F(2,122) = 4.86, p < .009 F_{CH}(1, 122) = 2.12, p > .148
3) MEEQ-B_n	0.462	0.194	0.140	F(3, 121) = 10.94, p < .001 F_{CH}(1, 121) = 21.46, p < .001

Note. MEEQ-B_p = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, positive scale; MEEQ-B_n = Marijuana Effect Expectancy Questionnaire—Adolescent Brief, negative scale.

[a] N = 125 because this variable calculated only if adolescent had access to marijuana for ≥45 days out of 90.