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Adolescent Substance Treatment Engagement Questionnaire for Incarcerated Teens

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Abstract

Background—Treatment engagement is often measured in terms of treatment retention and drop out, resource utilization, and missed appointments. Since persons may regularly attend treatment sessions but not pay close attention, actively participate, or comply with the program, attendance may not reflect the level of effort put into treatment. Teens in correctional settings may feel coerced to attend treatment, making it necessary to develop measures of treatment involvement beyond attendance. This study describes the development and validation of the Adolescent Substance Treatment Engagement Questionnaire (ASTEQ), Teen and Counselor versions.

Methods—The psychometric properties of the ASTEQ were examined in a sample of incarcerated teens ($N = 205$) and their counselors. Principal component analysis was conducted on teen and counselor versions of the questionnaire.

Results—Scales of positive and negative treatment engagement were found, reflecting both overt behaviors (joking around, talking to others) and attitudes (interest in change). Significant correlations with constructs related to treatment attitudes and behaviors, and misbehaviors (including substance use) demonstrate good concurrent and predictive validity. Teen and counselor ratings of engagement produced validity correlations in the medium effect size range.

Conclusions—These measures comprise a valid and reliable method for measuring treatment engagement for incarcerated teens.

Keywords

Adolescents; Treatment participation; Treatment engagement; Juvenile justice

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1. Introduction

Teens involved in the juvenile justice system are twice as likely to use substances than other teens their age (National Center on Addiction and Substance Abuse at Columbia University, 2004), with alcohol and marijuana reported as the two most frequently used substances among juvenile detainees (McClelland, Elkington, Teplin, & Abram, 2004). In addition, many teens within the justice system use substances routinely (Crowe, 1998; Dembo et al., 1999), and the prevalence of incarcerated adolescents meeting diagnostic criteria for substance abuse and dependence is great (McClelland et al., 2004; Neighbors, Kempton, & Forehand, 1992; Stein et al., 2006; Teplin, Abram, McClelland, Dulan, & Mericle, 2002). However, in a review of over 3,000 juvenile facilities nationwide, it is estimated that treatment for drug offenders is available in 67% of juvenile correctional facilities (Snyder & Sickmund, 2006), however, only 1% to 21% of adolescents received services in justice settings that provided them (Young, Dembo, & Henderson, 2007). Youths involved in the juvenile justice system are often unmotivated for intervention (Melnick, De Leon, Hawke, Jainchill, & Kressel, 1997; Prochaska et al., 1994), and therefore these adolescents are less likely to be engaged in treatment.

Treatment engagement can be defined as an individual's commitment to treatment and motivation to change (Battjes, Onken, & Delany, 1999). Treatment engagement for adolescents is often operationalized in attendance-based or retention-based terms such as treatment enrollment, attendance, retention, and drop out, especially early drop out (Dakof, Tejeda, & Liddle, 2001; Ingoldsby, 2010; Simpson & Joe, 1993). Treatment engagement can also be measured in terms of cognitive-based measures in the ongoing therapeutic process, where high levels of behavioral and cognitive engagement in treatment predicts stronger therapeutic relationships, greater confidence in treatment, more motivation, and better treatment outcomes (Gragg & Wilson, 2011; Melnick, DeLeon, Thomas, Kressel, & Wexler, 2001; Reisinger, Bush, Colom, Agar, & Battjes, 2003).

In instances where incarcerated teens are court-ordered to attend treatment for substance use, engagement in treatment cannot be mandated. Because adolescents may not pay close attention, actively participate, or comply with the structure of the program (Gainey, Catalano, Haggerty, & Hoppe, 1995), enrollment, attendance, and retention may not accurately reflect the level of effort put into changing. In addition, adolescent perceptions of coercion may play an important factor in their treatment engagement (Catalano, Hawkins, Wells, Miller, & Brewer, 1990; Ryan, Plant, & O'Malley, 1995).

Although adolescents who are coerced into treatment may receive a service that might not otherwise be available to them, coercion can compromise engagement for adolescents who do not believe they have a substance use problem and who are not motivated for change (Battjes, Gordon, O'Grady, Kinlock, & Carswell, 2003). Due to the challenges involved in assessing the treatment engagement of incarcerated teens, treatment participation, attitude, and investment beyond attendance are important to assess. Therefore, it is necessary to develop an adolescent measure of treatment engagement beyond attendance and retention-based measures.

1.1. Current measures of adolescent treatment engagement

Documentation of adolescent treatment engagement is often recorded as an assessment of quantifiable youth behaviors (i.e., attendance, participation) and treatment outcomes (i.e., abstinence from illicit drug use) (Brown, D'Amico, McCarthy, & Tapert, 2001; Reisinger et al., 2003). Measurements of adult treatment engagement in substance use disorders exist; however, developmentally appropriate measurements for adolescents are rare (Garnick et al., 2007). Broome, Joe, and Simpson (2001) examined a sample of 1,106 adolescents enrolled in 20 substance abuse treatment programs nationwide (residential, drug-free outpatient, and short-term inpatient facilities) and found that readiness for treatment (motivation/attitude) at intake predicted greater therapeutic involvement in treatment. This finding confirms another indicator of treatment engagement, though does not propose an exact measure to assess engagement.

In addition, adolescent treatment engagement in outpatient substance use disorder treatment setting has been explored using a version of the Washington Circle attendance-based engagement measure, modified for adolescents, and its relationship to a range of treatment outcomes, including substance use and control of problem behaviors (Garnick et al., 2012). Adolescents were 12 to 18 years old and identified as having a problem with substance use. Treatment engagement was defined as having received at least two additional outpatient treatment services within 30 days after the initiation date; however, it only quantified their participation and did not use a cognitive-based measure of engagement. Although this study reported on the research finding derived from the Washington Circle engagement measure (adolescent version), internal consistency and other methods to validate the measure for use with adolescents were not reported. Currently, no psychometrically sound questionnaires exist that assesses level of treatment participation, attitude, or investment beyond attendance and participation.

Given the lack of validated measures to evaluate adolescent treatment engagement beyond retention-based assessment, especially with adolescents involved in the juvenile justice system, we developed a set of questionnaires for assessing engagement in substance abuse treatment for incarcerated adolescents. The purpose of this study is to describe development and validation of the Adolescent Substance Treatment Engagement Questionnaire (ASTEQ), Teen and Counselor versions.

2. Materials and Methods

2.1. Site and treatment program

Participants were recruited at a state juvenile correctional facility in the Northeast, with charges ranging from simple truancy to aggravated assault. About 1150 teens per year are detained at the facility, about 475 teens per year are adjudicated to the facility, and annual recidivism is about 30%. Teens received group treatment as well as individualized attention (as indicated) on a variety of topics (sex-offending, drug dealing, reducing crime, developing empathy, preventing violence, anger management, etc.) provided by the facility. Teens enrolled in the research study were also randomized to receive either two sessions of individual motivational interviewing followed by 10 group sessions of cognitive behavioral

therapy or two sessions of individual relaxation therapy followed by 10 group sessions of substance abuse education treatment, which included elements of 12 step programs.

Teens received substance treatment shortly after adjudication for about 60 minutes per session over about 10 weeks. Five research counselors (1 male, 4 females; all Caucasian; 1 PhD, 3 MA-level, 1 BA-level) conducted all treatment types. Alcoholics Anonymous is available on a weekly basis. Community religious organizations also have a relationship with the facility. Limited vocational programming is available for teens as are transitional services that include substance use counseling, case management, mentoring and other services. All ethical standards for protecting human subjects complied with standards of the Institutional Review Board of the University of Rhode Island and the Helsinki Declaration of 1975.

2.2. Procedure

2.2.1. Participant screening and consent—Immediately after adjudication, teens were identified by facility staff as potential candidates for the study if they were between the ages of 14 to 19 years (inclusive) and were sentenced to the facility for between 4 and 12 months (inclusive). Consent was obtained from legal guardians, and assent was obtained from adolescents. Adolescents and guardians provided permission for adolescent participation in a larger treatment outcome study, of which the current study is a part. Guardians and adolescents were informed that all information was entirely confidential, except for plan to escape, hurt self or others, or reports of child abuse.

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 used marijuana or drank regularly (at least monthly) or they binge-drank (5 standard drinks for boys; 4 for girls); 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.

2.2.2. Assessment—The assessments consisted of 90 minutes of interview by a trained bachelors or masters-level staff member. Interviewers had about 20 hours of training with 2 hours of group and 1 hour of individual supervision per week. In-vivo observations were conducted regularly by a PhD-level project member. All assessment data were reviewed by a masters- or doctoral-level project member. Record reviews were completed following completion of the interviews.

Assessments occurred at baseline (shortly after adjudication), after the fifth and twelfth treatment sessions, and at 3 months and 6 months post release date. Adolescents received \$35 for completing baseline assessment and \$75 each for completing the 3 month and 6 month follow-ups.

2.3. Measures

2.3.1. Adolescent substance treatment engagement questionnaire (ASTEQ)—To develop the ASTEQ we started with the items from the Treatment Participation Questionnaire from our earlier work (see Stein et al., 2006), expanded the item pool based on interviews with incarcerated adolescents and group therapists, as well as clinical social

workers and guards, and sought to provide psychometric validation. During our interviews we were provided with information on what indicates poor adolescent involvement and good adolescent involvement in group and individual substance use treatment. From this process, items were generated and distributed anonymously to adolescents and facility staff for feedback. Wording changes were made based on feedback. The final set of items were rated on a Likert scale (1 = disagree strongly to 6 = agree strongly) and reflect various indicators of positive and negative treatment engagement. Versions to be completed by adolescent and counselor were created in this process. An additional item was provided on the youth version at the end of the measure. It asked about the relative advantages or disadvantages the youth saw to attending substance treatment. Responses were based on a 6-point Likert: 1 = many more advantages to attending treatment to 6 = many more disadvantages to attending treatment.

The items for the adolescents contained all the content of the items of the counselor with an additional 9 items specific to how the adolescent felt or thought. Adolescents completed the ASTEQ (ASTEQ-Teen) at initial assessment and after the fifth substance treatment session. At initial assessment adolescents had been in the facility for some time and could have some discussions around substance abuse while in the facility in the absence of the formal substance abuse treatment offered later. Counselors, however, could not complete ASTEQ assessments at initial assessment since the substance abuse treatment sessions had not yet begun and they had no experience with the adolescents. Substance use group counselors completed assessments after the fifth and twelfth treatment sessions (ASTEQ- Counselor). The first administration of each version of the measure was used for principal component analyses. The average length of time between ASTEQ-Teen Baseline and ASTEQ-Teen fifth session was 32 days ($SD = 15$), and average length between ASTEQ-Counselor fifth session and ASTEQ-Counselor twelfth session was 42 days ($SD = 24$).

2.3.2. Record review—The record review was used to enhance truthfulness of self-reported alcohol/marijuana use and illegal activity. Records contained information about charges and previous incarcerations.

2.3.3. Background questionnaire—Socio-demographic information was recorded including age, gender (male = 0, female = 1), race (non-White = 1, White = 0), number of years of school completed, and parent/guardian educational level. At follow-up participants reported the number of times arrested since release (not arrested = 0, arrested 1 or more times = 1).

2.3.4. Motivation ladder—alcohol/marijuana (ladder-A, ladder-M)—The visual analog ladder composed of 10 rungs and associated anchor statements was used to measure motivation to change alcohol use (Clair et al., 2011) and marijuana use (Slavet et al., 2006). Directions for the ladder indicate: “Each rung on this ladder shows where a person might be in thinking about changing their drinking (or marijuana use). Select the number that best matches where you are now.” Ladders-A and -M were administered at baseline, after the twelfth treatment session, and at 3 month follow-up.

2.3.5. Timeline followback (TLFB)—Timeline followback is a calendar-assisted method to elicit drinking behavior reports over a specified time period (Sobell & Sobell, 1992; 1995), with excellent reliability and validity (Allen, Columbus, & Fertig, 1995; Sobell, Maisto, Sobell, & Cooper, 1979). We used the same calendars and methods to collect data regarding marijuana use (Stephens, Wertz, & Roffman, 1993). Summary scores included percentage of drinking days and percentage of marijuana use days. It was completed at baseline and at 3 month follow-up for 90-day periods.

2.3.6. Composite international diagnostic interview—Short form—This diagnostic interview (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998) is reliable and valid (Cottler, Robins, & Helzer, 1989; Robins et al., 1988). The Short Form consists of 3–8 questions per diagnosis. Modules for alcohol and marijuana abuse and dependence were administered at baseline.

2.3.7. Group participation—After each group treatment session counselors completed a grid to track the behavior of individual adolescents in group, as well as elements of the group as a whole (Sampl & Kadden, 2001). Elements tracked on this sheet included attendance (late, present, absent), quantity of participation based on 4-point Likert of 0 = none to 6 = high, quality of participation based on 4-point Likert of 0 = none to 6 = high, clinical status (current mental status and overall functioning) based on 4-point Likert: 1 = poor to 5 = excellent, and number of disruptive behaviors that were displayed (aggressive, interrupts, profanity, sexually inappropriate, glorifying drug use or other poor behaviors, etc.) during the group treatment. For more information on this measure, see Stein (2005) or Sampl and Kadden (2001).

2.3.8. Data analysis approach—Principal components analyses (PCA) with varimax rotation were conducted separately for the teen and counselor ratings. Responses to only the first administration of the instruments were used in the PCA. The number of components retained was determined using multiple criteria: scree test (Cattell, 1966), the minimum average partial correlation (MAP), and parallel analysis (Horn, 1965). Parallel analysis and MAP have been found to be one of the most consistently accurate methods of PCA (Zwick & Velicer, 1986). Items were retained if the loading was .40 or higher (Stevens, 1992). Items that loaded .40 on more than one component or did not have a meaningful loading on any one component (.40) were removed. Change in treatment engagement over time was assessed with paired t-tests using the first and second administrations of the ASTEQ.

To investigate validity, the ASTEQ scales were correlated with data collected at initial assessment. The strongest indicator of construct validity of the ASTEQ-Teen theoretically should be motivation to decrease or quit alcohol and marijuana use, and perceived disadvantages to treatment. Amount of problems experienced from drug use should also predict engagement; therefore it should reflect concurrent validity while being a different construct. To a lesser extent, frequency of alcohol or marijuana use may indicate concurrent validity. The strongest indicator of construct validity of the ASTEQ-Counselor should be the quality and quantity of teen participation and the number of disruptive behaviors displayed during treatment. On the other hand, treatment engagement should be unrelated to demographics, so these are used as measures of discriminant validity for both ASTEQ Teen

and Counselor. Predictive validity should be shown by negative correlations with drug and alcohol use and fewer arrests after release. Finally, hierarchical multiple regression was used to assess whether the predictive relationship of ASTEQ scales and substance use after release was independent of pretreatment use. Pre-incarceration value of the outcome variable (percent drinking days or percent marijuana use days) was entered first as a control variable, followed by the ASTEQ scale score.

3. Results

3.1. Sample characteristics

We screened 401 potential participants for the study between the ages of 14 to 19 years and sentenced for between 4 and 12 months. There were 178 adolescents excluded from the study: 25 because they did not meet substance use criteria, 4 because they did not understand English, 49 because parents could not be reached for consent, and 100 because they were already enrolled in another study at this facility. Of those that met eligibility requirements, 15 adolescents and 3 parents declined to participate. The adolescent participants ($N = 205$) had the following racial/ethnic background: 2.5% Hispanic, 37.8% African American, 26.1% White, 5.0% Asian American, 6.7% Native American, and 5.9% Pacific Islander and 16.1% self-identified as “other”. Most were boys (89.0%), average age was 17.1 years ($SD = 1.0$), and on average the sample had been incarcerated 2.4 times before the current incarceration ($SD = 2.3$). In the last year, 25.3% and 57.6% qualified for alcohol and marijuana use disorders, respectively. At the fifth treatment session, 187 adolescents completed the ASTEQ (18 participants dropped out of the study). At the 3 months after release, 171 participants completed the follow-up interview ($n = 25$ participants dropped out of the study, and 9 were lost to follow-up). At the 6 months after release 162 participants completed the follow-up interview (28 participants dropped out of the study and 15 were lost to follow-up). There were 185 counselor rating forms completed for 185 participants (one per participant) at the fifth treatment session and 174 forms completed at the twelfth treatment session.

3.2. Scale creation and internal consistency

3.2.1. ASTEQ-Teen—For the ASTEQ Teen questionnaire MAP retained three components, and scree plot and parallel analysis retained four components. Table 1 displays loadings for teen-rated ASTEQ items. Average loading per item was 0.60. Component 1 (ASTEQ-Teen Receptivity to Change Substance Use) consists of 14 items with coefficient $\alpha = .87$ and accounts for 18.8% of variance. Items reflect interest and engagement in positive change including positive cognitions and contemplation. Component 2 (ASTEQ-Teen Treatment Disruption/Disengagement) has eight items with coefficient $\alpha = .71$ and accounts for 9.5% of the variance. Items reflect lack of interest and negative treatment engagement. Component 3 (ASTEQ-Teen Participation Choice) consists of 2 items with coefficient $\alpha = .73$ and accounts for 5.5% of the variance. Items reflect perceptions of having little choice over treatment attendance. Component 4 (ASTEQ-Teen Participation Pushback) consists of 5 items with coefficient $\alpha = .62$ and accounts for 9.3 of the variance and reflects lack of openness to participation. The one positively loaded item was reversed scored so that higher scores on ASTEQ-Teen Participation Pushback reflect more

pushback. ASTEQ-Teen Receptivity to Change Substance Use was significantly correlated with ASTEQ-Teen Treatment Disruption/Disengagement ($r = .13, p < .05$), ASTEQ-Teen Participation Pushback ($r = -.23, p < .001$), but not ASTEQ-Teen Participation Choice ($r = .10, ns$). ASTEQ-Teen Treatment Disruption/Disengagement was significantly correlated with ASTEQ-Teen Participation Choice ($r = -.14, p < .05$) and ASTEQ-Teen Participation Pushback ($r = .26, p < .001$). ASTEQ-Teen Participation Choice and ASTEQ-Teen Participation Pushback were significantly correlated ($r = -.22, p < .01$).

3.2.2. ASTEQ-Counselor—For the ASTEQ-Counselor, MAP, scree plot, and parallel analysis retained two components. Table 2 displays loadings for ASTEQ-Counselor items. Two components were retained that accounted for 58.0% of the variance with average loading per item of .73. Component 1 (ASTEQ-Counselor Receptivity to Change) consists of 13 items reflecting positive engagement with a coefficient alpha of .94 and accounts for 43.2% of variance. Component 2 (ASTEQ-Counselor Treatment Disengagement) consists of 7 items with a coefficient alpha of .90 and accounts for 14.8% of variance. Component 2 reflects treatment disengagement and perceptions of having little choice over treatment attendance. The correlation between the two components is $r = -.40, p < .001$. ASTEQ-Counselor Receptivity to Change was significantly correlated with ASTEQ-Teen Receptivity to Change Substance Use ($r = .23, p < .01$), ASTEQ-Teen Treatment Disruption/Disengagement ($r = -.13, p < .05$), ASTEQ-Teen Participation Pushback ($r = -.23, p < .001$), but not ASTEQ-Teen Participation Choice ($r = .01, ns$). ASTEQ-Counselor Treatment Disengagement was significantly correlated with ASTEQ-Teen Receptivity to Change Substance Use ($r = -.22, p < .01$), ASTEQ-Teen Treatment Disruption/Disengagement ($r = .39, p < .001$), ASTEQ-Teen Participation Pushback ($r = .19, p < .01$), but not ASTEQ-Teen Participation Choice ($r = -.06, ns$). Correlations between teen and counselor scales are generally in the small–medium effect size range (Cohen, 1988) and in expected directions (e.g., Teen-Receptivity to Change Substance Use scale is negatively and significantly correlated with Counselor-Treatment Disengagement scale).

3.3. Change over time

Scale scores were calculated as the mean of items on the component. Change in treatment engagement over time was assessed with paired t-tests using the first and second administrations of the ASTEQ. ASTEQ scale scores increased from the first administration to the second administration, and results are presented in Table 3.

3.4. Construct and predictive validity data

Construct validity correlations are presented in Table 4. ASTEQ-Teen scales were not related to demographic variables (age, gender, race/ethnicity), or number of times previously incarcerated, except for ASTEQ-Teen Treatment Disruption/Disengagement which was negatively related to participant age. These results generally demonstrate discriminant validity. ASTEQ-Teen Receptivity to Change Substance Use positively correlates with motivation ladders for alcohol and marijuana and negatively with disadvantages to treatment. ASTEQ-Teen Treatment Disruption/Disengagement correlates negatively with motivation ladders for alcohol and marijuana. ASTEQ-Teen Participation Choice correlates negatively with motivation ladder for alcohol. Additionally, ASTEQ-Teen Participation Pushback

correlates negatively with motivation ladders for alcohol and marijuana and positively with disadvantages to treatment. These results demonstrate construct validity. ASTEQ-Teen Receptivity to Change Substance Use correlates positively with marijuana dependence and alcohol dependence demonstrating concurrent validity.

Predictive validity correlations are presented in Table 5. ASTEQ-Teen Receptivity to Change Substance Use was negatively correlated with the percent of days adolescents drank at 3 months after release, percent of days used marijuana 3 and 6 months after release and whether or not the adolescent had been arrested 6 months after release. ASTEQ-Teen Treatment Disruption/Disengagement was positively correlated with the percent of days adolescents drank and percent of days used marijuana at 3 months after release, and whether or not the adolescent had been arrested 3 months after release. Whether the adolescent was arrested at 3 months after release was related to ASTEQ-Teen Treatment Disruption/Disengagement ($t(169) = 2.16, p < .05$), and ASTEQ-Teen Receptivity to Change Substance Use was related to arrest at 6-months post-release ($t(160) = 2.58, p < .01$). ASTEQ-Teen Receptivity to Change Substance Use was higher for those who were not arrested after release ($M = 4.09, SD = .79$) compared to those who were arrested ($M = 3.73, SD = .80$). ASTEQ-Teen Treatment Disruption/Disengagement was lower for those who were not arrested after release ($M = 2.32, SD = .66$) compared to those who were arrested ($M = 2.56, SD = .80$). In hierarchical multiple regression, the ASTEQ-Teen Treatment Disruption/Disengagement score significantly predicted percent drinking days 3 months after release, even after variance due to pre-incarceration drinking had been considered, ($sr^2 = .17, \beta = .17, F(1,163) = 5.37, p < .05$).

ASTEQ-Counselor was correlated with counselor ratings of teen session behavior collected concurrently to investigate validity. All the counselor ratings of teen treatment behaviors were considered to reflect construct validity. These correlations are presented in Table 6. ASTEQ-Counselor Receptivity to Change correlates positively with quality and quantity of participation and clinical status, and negatively with the number of disruptive behaviors during treatment and disadvantages to treatment. ASTEQ-Counselor Treatment Disengagement correlated negatively with quality and quantity of participation and clinical status, and positively with the number of disruptive behaviors during treatment. These demonstrate good construct validity. ASTEQ-Counselor scales were not related to demographic variables (age, gender, race/ethnicity) or number of times previously incarcerated, except for ASTEQ-Counselor Receptivity to Change correlating positively with participant age and ASTEQ-Counselor Treatment Disengagement correlating positively with number of times previously incarcerated. These results generally demonstrate discriminant validity.

Predictive validity was investigated by correlating ASTEQ-Counselor with teen outcomes. ASTEQ-Counselor Treatment Disengagement was positively correlated with the percent of days adolescents drank and percent marijuana use days 3 months after release. ASTEQ-Counselor Receptivity to Change was negatively correlated with percent of days adolescent drank at 3 months and 6 months after release and percent marijuana use days at 6 months. Both scales were related to whether or not the teen had been arrested 6 months after release. Counselor-rated receptivity to change was higher for those who were not arrested after

release ($M = 4.52$, $SD = .53$) compared to those who were arrested ($M = 4.16$, $SD = .58$). Counselor-rated treatment disengagement was lower for those who were not arrested after release ($M = 2.23$, $SD = .75$) compared to those who were arrested ($M = 2.56$, $SD = .96$). In the hierarchical multiple regression the ASTEQ-Counselor Receptivity to Change score significantly predicted percent drinking days 6 months after release, even after pre-incarceration drinking had been considered, ($sr^2 = -.19$, $\beta = -.19$, $F(1,135) = 4.25$, $p < .01$). The ASTEQ-Counselor Receptivity to Change score significantly predicted percent marijuana use days 6 months after release, even after pre-incarceration marijuana use had been considered, ($sr^2 = -.18$, $\beta = -.18$, $F(1,133) = 4.74$, $p < .05$).

4. Discussion

Results indicate that the ASTEQ measures comprise a valid and reliable method for measuring treatment engagement for incarcerated adolescents receiving treatment in group format and in a residential milieu. Substance abuse counselor ASTEQ results fell into clearly identified components of treatment disengagement and receptivity to change substance use. Teen ratings of their own engagement suggest a four-factor model of treatment engagement that includes receptivity to change substance use, treatment disruption/disengagement, choice to attend treatment, and participation pushback.

Generally, scales produced good internal consistency (median $\alpha = .88$). Adolescent engagement in substance use treatment increased over time. The array of significant correlations with constructs related to treatment attitudes and behaviors and with self-rated motivation to change shows good construct validity for all ASTEQ scales. Correlations with pre-incarceration substance use problems show some concurrent validity for the teen Receptivity to Change Substance Use scale, while substance use itself is unrelated to treatment engagement. Misbehaviors (including substance use) demonstrate good concurrent and predictive validity. Adolescent ratings of engagement generally produced correlations in the medium effect size range (Cohen, 1988) when they were significant, and this is especially true of the self-rated Receptivity to Change Substance Use scale. Counselors produced ratings that correlated with constructs at medium or better effect sizes. As expected, the Receptivity to Change and Treatment Disengagement scales were negatively correlated.

Most compelling is the results for predictive validity. Counselor and Teen ASTEQ ratings on receptivity to change and treatment disruption/disengagement factors predicted teen post-release frequency of alcohol and marijuana use and arrests. Although less than 4% of variance in these is accounted for by the ASTEQ scales, this is the most compelling evidence for the value of these ratings as indicators of engagement in a way that facilitates teen improvement. These predictions were not due to pretreatment substance use frequency, just to the engagement measures.

This is an important area of study given concerns regarding the potential negative effects of group-based treatments for adolescents. Group-based treatment with at-risk adolescents has been found to create unplanned iatrogenic effects (Dishion, McCord, & Poulin, 1999; Dishion, Poulin, & Burraston, 2001; Mager, Milich, Harris, & Howard, 2005) particularly

for those with low levels of delinquency prior to cognitive-behavioral group treatment (Poulin, Dishion, & Burraston, 2001). Contrary to these findings, group-based cognitive behavioral treatments are consistently related to reduced adolescent substance use (Waldron & Kaminer, 2004), and have been as efficacious as other treatments in decreasing substance use and delinquency (French et al., 2008).

The contradictory results may in part be due to the variety of methods used to assess negative (and positive) group treatment engagement. The methods presented here are a first step towards establishing a common method of assessing group treatment engagement that includes both positive and negative factors, and for teens more nuanced factors including perceived choice and openness to treatment.

Although results are promising, replication and cross validation are recommended. Given the number of items per scale and the generally high loadings found, we can be relatively confident that our results would replicate in cross validation (see Guadagnoli & Velicer, 1988). Future research should study these measures in other settings to see if they generalize to other teen treatment settings, and to other correctional facilities. In addition, construct validity analyses were based on single items; and although we used five single-item measures, future work should be conducted using scales to address construct validity. The participation choice scales are limited to two items. Future work should expand the breadth of this construct with additional items. Although more research is needed to determine whether the adolescent and staff versions provide complimentary but different information, this article is important because these tools may be used as part of a multi-method, multi-informant approach to assessment. Such multi-method approaches bolster confidence in assessed constructs. Similarly, they may allow for choice of assessment approaches when resources are limited (teen rather than counselor providing reports of behaviors).

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Table 1

Varimax rotated loadings for teen-rated ASTEQ items.

	Item loading	Scale α	% of Variance
Receptivity to change substance use		.87	18.8
I spend time thinking about how my substance use affects others.	.73		
I worry about my use of substances.	.70		
I think about how my life would be different without substances.	.69		
I try to learn ways of reducing my substance use.	.66		
I think a lot about the good and bad things about substance use.	.62		
I'd like to help others reduce their substance use.	.62		
I spend time thinking about how my substance use affects me.	.61		
Going to treatment helps me change my substance use.	.59		
I want to reduce my involvement in substance use.	.59		
I am trying to change my life-style (including peer group) in order to reduce substance use.	.55		
In treatment, I talk and share things about my substance use.	.53		
I see a connection between substance use and crime.	.52		
I try hard to learn something positive in treatments that discuss my substance use.	.51		
I try to talk with others about my substance use.	.47		
Treatment disruption/disengagement		.71	9.5
In groups that discuss substance use, I try to get others to break the rules or do things they should not do (for example, by winking, nodding or smiling at them).	.71		
I make fun of others I see who are trying to change their substance use.	.63		
I go to groups mostly because my friends are there.	.60		
I like to joke around in treatment when they start talking about substance use.	.56		
I think I can change my substance use.	-.56		
In treatments that discuss substance use, I sometimes make obscene or nasty gestures.	.49		
I want to reduce my involvement in crime.	-.47		
In treatments that discuss substance use, I like to talk about the "good times" when I am not locked up (misbehaviors like destroying property, stealing, making trouble at school).	.43		
Participation choice		.73	5.5
I have a choice on which treatments to attend at the facility.	.83		
I have a choice on whether to attend substance abuse treatment.	.79		
Participation pushback		.62	9.3
I do not pay attention during treatment that focuses on substance use.	-.65		
I do not want any help from counselors or groups regarding my substance use.	-.65		
I listen to people who want to help me change my substance use.	.53		
I will participate in treatment for substance use because I have to (I have to please the judge; I want to earn points, etc.).	-.51		
I often feel pressured to participate in treatment against my wishes.	-.40		

Note: n = 205 at baseline administration.

Table 2

Varimax-rotated loadings for counselor-rated ASTEQ items.

	Item loading	Scale α	% of Variance
Receptivity to change		.94	43.2
Talks with others about substance abuse in a constructive way.	.85		
Tries hard to learn something positive in treatment that discusses substance use.	.85		
Tries to help others reduce their substance use.	.83		
Listens to people who want to help change his/her substance use.	.81		
Teen appreciates staff who wants to help him/her reduce substance use.	.80		
Teen is trying to change his/her life-style (including peer group) in order to reduce substance use.	.78		
Wants to reduce involvement in crime.	.78		
Wants to reduce involvement in substance use.	.77		
Tries to learn ways of reducing substance use.	.76		
Seeks out information or people who can help her/him reduce substance use.	.69		
Gets involved and participates in treatment focusing on substance use.	.61		
Teen sees a connection between substance use and crime.	.58		
In treatment, talks and shares personal things about his/her substance use.	.53		
Treatment disengagement		.90	14.8
In groups that discuss substance use, teen tries to get others to break the rules or do things they should not do (for example, by winking, nodding or smiling at them).	.92		
Makes fun of others who are trying to change substance use.	.86		
In groups that discuss substances, other teens encourage this teen's poor behavior (for example, by winking, smiling, nodding).	.84		
In treatments that discuss substance use, teen sometimes makes obscene or nasty gestures.	.75		
When discussing substance use, fools around too much, is distracted or distracts others.	.74		
Does not pay attention during therapeutic discussions about substance use.	.64		
In treatments that discuss substance use, teen likes to talk about the "good times" when she/he is not locked up (misbehaviors like destroying property, stealing, making trouble at school).	.62		

Note: n = 185 counselor ratings at session 5 administration.

Table 3

Means and standard deviations for Teen and Counselor ASTEQ Scales and paired t-tests of means over time.

	<u>Baseline</u>	<u>Session 5</u>	<u>Session 12</u>	
	Mean (SD)	Mean (SD)	Mean (SD)	t(df)
Teen				
Receptivity to change substance use	3.95 (.87)	4.27 (.93)	—	4.87 (186)***
Treatment disruption/disengagement	2.36 (.68)	2.18 (.55)	—	3.42 (186)***
Participation choice	4.21 (1.34)	4.81 (1.13)	—	5.79 (186)***
Participation pushback	2.56 (.83)	2.16 (.82)	—	5.70 (186)***
Counselor				
Receptivity to change	—	4.39 (.60)	4.46 (.54)	.76 (169)
Treatment disengagement	—	2.31 (.80)	2.51 (.86)	4.18 (169)***

Note. n = 205 teen baseline, n = 187 teen session 5, n = 185 counselor session 5, n = 174 counselor session 12.

p .001.

Table 4

Relationship between the ASTEQ-Teen baseline and discriminant, construct, and concurrent validity measures.

	Receptivity to change substance use	Treatment disruption/disengagement	Participation choice	Participation pushback
	r or t(df)	r or t(df)	r or t(df)	r or t(df)
Discriminant validity				
Age	.01	-.13 *	.09	-.04
Race	1.06 (200)	1.65(200)	.73 (199)	1.09(200)
Gender	.43 (203)	.44 (203)	1.71 (202)	1.23 (203)
# of times previously incarcerated	-.02	-.01	-.10	.06
Construct validity				
Disadvantages to treatment	-.26 ***	.09	.03	.19 **
Motivation ladder—Alcohol	.31 ***	-.26 ***	-.11 *	-.15 *
Motivation ladder—Marijuana	.39 ***	-.32 ***	-.04	-.13 *
Concurrent validity				
% marijuana days pre- incarceration	-.09	-.01	.11	-.04
% drinking days pre- incarceration	-.09	-.05	-.01	-.09
# of marijuana dependence symptoms	.22 **	.01	.08	-.12
# alcohol dependence symptoms	.17 **	.01	-.01	-.11

Note. n = 205.

*
p .05.

**
p .01.

p .001.

Table 5

Relationship between the ASTEQ-Teen baseline and predictive validity measures.

	Receptivity to change substance use	Treatment disruption/disengagement	Participation choice	Participation pushback
	r or t(df)	r or t(df)	r or t(df)	r or t(df)
3 Months after release				
Percent drinking days ^a	-.13 *	.16 *	-.04	.05
Percent marijuana use days	-.14 *	.14 *	-.08	-.06
Arrested since release	.97 (169)	2.16 (169) *	.12 (168)	.78 (169)
6 Months after release				
Percent drinking days ^a	-.07	.11	-.02	-.02
Percent marijuana use days	-.15 *	.02	.11	.02
Arrested since release	2.58 (160) **	.59 (160)	.01 (160)	.18 (160)

^aLog transformed to correct skewness.*
p .05.**
p .01.

Table 6

Counselor ASTEQ and discriminant, construct, and predictive validity.

	Counselor ratings	
	Receptivity to change	Treatment disengagement
	r or t (df)	r or t (df)
Discriminant validity		
Teen age	.14 *	-.08
Teen race	.20 (180)	.21 (180)
Teen gender	.32 (183)	1.55 (183)
# times previously incarcerated	-.01	.15 *
Construct validity		
Quantity of participation ^a	.19 **	-.21 **
Quality of participation ^a	.23 **	-.47 ***
Clinical status ^a	.13 *	-.26 ***
Disadvantages to treatment ^b	-.16 **	.09
# of disruptive behaviors during treatment ^a	-.14 *	.42 **
Predictive validity		
% drinking days ^c , 3 months post release	-.19 **	.18 *
% marijuana use days, 3 months post release	-.12	.15 *
% drinking days ^c , 6 months post release	-.18 *	.13
% marijuana use days, 6 months post release	-.19 *	.05
Arrested, first 3 months post release	.50 (163)	1.43 (163)
Arrested, second 3 months post release	3.79 (154) ***	2.25 (154) *

^aRatings provided by counselor.^bRatings provided by teens.^cLog transformed to correct skewness.*
p .05.**
p .01.***
p .001.