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Screening and Assessment Tools for Measuring Adolescent Client Needs and Functioning in Substance Abuse Treatment

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Abstract

The purpose of this study is to establish the psychometric properties of a non-commercial, publicly available, modular screening and assessment system for adolescents in substance abuse treatment. Data were collected in 2011-2012 from 1189 adolescents admitted to 8 residential treatment programs in urban and rural locations in the United States. Results from 3 sets of analyses documented the instruments to be reliable. Females reported more problems than males, and younger adolescents reported more problems than older youth. Implications and limitations are discussed, and suggestions for future research are provided.

Keywords

Adolescents; substance use; assessment; screening; psychological functioning; social functioning; judgment and decision making; motivation; engagement

INTRODUCTION

Comprehensive screening and assessment of problem areas is an essential component of substance abuse treatment. Results can be used to determine appropriateness for treatment, document clinical information and presenting problems, and communicate with funding sources and oversight entities regarding clients who are receiving services. But screening and assessment can serve additional purposes as well, functioning as an integral part of adaptive treatment (McKay, 2009) and providing important information to program managers about gaps in needed services (Lehman, Simpson, Knight, & Flynn, 2011).

Several tools are currently available for screening and assessment with adolescent populations (see Winters, 2004; Winters, Stinchfield & Bukstein, 2008), including the Global Appraisal of Individual Needs (GAIN; Dennis, Titus, White, Unsicker, & Hodgkins, 2003), Comprehensive Adolescent Severity Inventory (CASI; Meyer, McLellan, Jaeger, & Pettinati, 1995), and Teen Addiction Severity Index (T-ASI; Kaminer, Bukstein, & Tarter, 1991). While these are established as reliable and valid instruments, agencies may elect not

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Declaration of Interest

The authors report no conflicts of interest.

to use them due to limited financial or staffing resources. As an alternative to screening instruments that require a fee, agencies often utilize open-ended response formats when eliciting background information on clients as they enter treatment (e.g., psychosocial or clinical intake interviews), or develop their own tools that may or may not include reliable measures. Using the results of such practices in treatment planning can become burdensome. Furthermore, screening needs of agencies may vary depending on the clientele served or the existence of specialized service options. For instance, an agency serving high-risk juvenile justice-involved clients might wish to screen for criminal thinking, whereas another serving few justice-involved youth may elect not to do so. What is needed is a modular approach to screening that enables agencies to customize screening domains, provides individual client reports based on reliable assessment instruments, and is available at minimal cost. Such a system currently exists for adults (see Simpson, Joe, Knight, Rowan-Szal, & Gray, 2012), but little is known regarding the utility and appropriateness of a similar package tailored specifically to adolescents.

The purpose of this study is to provide evidence for publicly available screening instruments that form a modular system for adolescents in treatment and that map onto components of the Texas Christian University (TCU) Treatment Process Model (Simpson, 2004). Some elements of the system are adaptations of instruments used previously with adolescents, while others are adaptations of instruments originally developed for adults in treatment. Because the system modules are self-administered and items in each domain attempt to assess problems at a global level, the system described herein should be considered a “screening” tool rather than a “clinical assessment” (which typically provides comprehensive assessment of problems and requires scoring and interpretation by highly skilled clinicians; Leccese & Waldron, 1994). Modules administered at treatment entry and used to determine triage into specific services or a need for additional diagnostics should be considered “screens.” Many of these same domains can be measured over time, and some (e.g., clinical engagement) are only measured at later points in the process. Thus, the same modules can also be considered “assessments” that address specific aspects of the client’s progress during treatment.

The TCU Treatment Process Model and Assessment Approach

The TCU Treatment Process Model (Simpson, 2004) incorporates evidence for the roles of pre-treatment factors and treatment engagement in promoting positive and sustained change over time and provides a platform for screening and assessment administration. Motivation for treatment (i.e., problem recognition, desire for help, treatment readiness) is closely tied to retention (Simpson & Joe, 1993), acknowledgement of personal and social problems (e.g., depression, anxiety, hostility, risk-taking), and a willingness to engage in treatment activities (e.g., participation, counselor rapport; Simpson, Joe, Rowan-Szal, & Greener, 1995). Motivated clients are nearly twice as likely to attend sessions and develop productive relationships with counselors compared to their unmotivated counterparts (Simpson & Joe, 2004). Those with strong counselor rapport are twice as likely to report higher psychosocial functioning and reduced drug use after 3 months of treatment. Relationships among these core treatment processes have been documented in adolescent samples (Joe, Knight, Becan, & Flynn, in press). Furthermore, these measures are also important predictors of post

treatment outcomes in adults (Joe, Simpson, Dansereau, & Rowan-Szal, 2001; Simpson, Joe, & Rowan-Szal, 1997) and adolescents (Edelen et al., 2007; Joe et al., in press). Thus, motivation is an indicator of the likelihood of engagement and should be measured along with baseline levels of psychosocial functioning at intake. Because engagement is a predictor of psychosocial change and improved outcomes, assessing level of participation and rapport with counselors after a period of time in treatment (1 to 3 months) is useful in determining whether additional strategies for increasing treatment engagement are needed.

A modular assessment system linking instruments to critical elements of the TCU Treatment Process Model currently exists for adult populations. The core battery (Simpson et al., 2012) includes the TCU RISK which measures demographics and criminal history; the TCU Client Evaluation of Self and Treatment (CEST) which measures motivation (MOT), psychological functioning (PSYC), social functioning (SOC), and treatment engagement (ENG); and the TCU Drug Screen which measures history and severity of use. Other modules include the Criminal Thinking Scales (CTS; Knight, Garner, Simpson, Morey, & Flynn, 2006) and HIV Risk Form (HIV; Simpson et al., 1994). Clients complete scannable paper versions of the forms which are automatically converted into individualized reports. Reports can then be used to inform and revise treatment plans over time (Knight, Dockins, & Bradford, 2010). Some of these instruments have been used successfully with adolescent populations (Dembo, Turner, & Jainchill, 2007), but the psychometric properties of the comprehensive set has not yet been determined. Because, adolescents differ from adult counterparts in substantial ways—including, but not limited to their reliance on parents/caregivers, involvement in school, association with peers, and use of decision-making strategies—the TCU adult assessment system was modified to incorporate context and language specific to youth and expanded to include modules for measuring social relationships (Family, Friends and Self; FFS; Simpson & McBride, 1992) and judgment and decision making (Dansereau, Knight, & Flynn, 2013).

Two important areas of adolescent functioning not included in the TCU Process Model that also have implications for treatment engagement and sustained behavioral change include social relationships (family and peer) and judgment and decision making. While the CEST includes three scales pertaining to these areas—Social Support (from SOC), Peer Support (from ENG), and Decision Making (from PSYC)—these may not be sufficient to adequately screen for problems in these areas among adolescents. Prior research has documented the role of family and peers in facilitating both continued use (e.g., Kandel, 1996) and recovery (e.g., Brook et al., 2001). Information regarding social risk factors and resources for recovery can be useful in treatment and discharge planning. Recent research also suggests that peer influences not only shape personal choices in positive and negative ways, but can also affect the quality of decision-making in everyday contexts (Albert, Chein, & Steinberg, 2013). This has implications for treatment efforts aimed at improving problem recognition and decision making.

Research has shown that adolescents often experience challenges with regard to decision making, including less preparedness for coping with difficult situations (Myers & Brown, 1990) and a tendency to act impulsively while experiencing intense emotions (Zapolski, Cyders, & Smith, 2009). These issues impact judgment and decision making, not only with

regard to personal behaviors that lead to substance abuse (e.g., Alberts, Elkind, & Ginsberg, 2007; Cyders et al., 2007), but also with regard to their willingness to engage in treatment (e.g., participate openly in groups, objectively examine consequences of personal decisions). Concerning problem recognition, youth frequently underestimate the extent of harm and consequences that result from their decisions and overestimate their level of control in a situation (Quadrel, Fischhoff, & Davis, 1993; Wickman, Anderson, & Greenburg, 2008). Screening for maladaptive or deficient thinking can be important when striving to adapt treatment to client needs. Attention difficulties, for instance, can interfere with educational and rehabilitation efforts (Meltzer, 2007), and screening for these problems may signal a need for further education diagnostics. Identifying deviant thinking patterns (i.e., cold heartedness, personal irresponsibility) may also be helpful in informing treatment approaches, especially among juvenile justice-involved youth (Dembo et al., 2007).

The goal of the current study is to provide evidence for a publicly available, modular screening and assessment system for adolescent treatment planning and progress monitoring. Study aims are to (a) describe minor modifications made to existing assessment scales for youth and adults to make them more appropriate for use with adolescents, (b) document the psychometric properties of these modified scales for adolescent populations, (c) provide means and quartiles for clinical reference, and (d) examine differences due to gender and age.

METHOD

Procedure and Instrumentation Package

The current study uses data collected in 2010 and 2011 as part of a National Institute on Drug Abuse (NIDA)-funded multi-site research project designed to (a) develop a modular screening and assessment system for substance using adolescents and (b) examine the effectiveness of a cognitive-based treatment readiness intervention for youth in the early weeks of treatment (Bartholomew, Dansereau, Knight, Becan & Flynn, 2011). Participants included adolescent clients admitted to eight residential treatment programs in three states. The agencies involved in this project represent diverse programs and geographic locations. One is suburban and serves 26 clients on a typical day, contrasted with another program located in a rural area that serves close to 100 clients on a typical day. There was a broad range of staffing patterns, with 5 programs reporting 4-10 counselors, 2 with 10-30 counselors, and 1 reporting 30+ counselors. All programs reported an average caseload of 10 or fewer clients. The average number of clients served daily varied by program, with 4 serving 20-40 clients daily and 4 serving 50-100 clients daily. Planned length of stay ranged from 30 days up to 12 months.

Each program agreed to incorporate the TCU Adolescent Screening and Assessment Package (TCU-ASAP) into their clinical practice and signed a Qualified Service Organization Agreement (QSOA) stipulating that all data shared with TCU by the programs would be de-identified. To ensure that no identifying information was shared with the research team, agency staff assigned a unique identifier to each client and only that ID was shared with research staff.

The TCU-ASAP could be administered in one of two ways, through paper-pencil forms (which could be scanned into data files and uploaded into an Excel-based reporting program) or through an online assessment portal. The TCU-ASAP consisted of 11 modules, each comprised of approximately 36 items (contained on a single Scantron sheet). Modules corresponded with general assessment topics: General Risk (RISK A, RISK B), Drug Screen-II, Psychological Functioning (PSYC), Social Functioning (SOC), Family Friends and Self (FFS), Motivation (MOT), Engagement (ENG), HIV/Criminal Thinking (HIV/CTS), and Judgment and Decision Making (THINK A, THINK B). To ensure sufficient sample sizes for psychometric analyses and representation across programs, all modules were linked together and administered to all clients. To facilitate communication with research staff and enable real-time reporting of results, all programs were encouraged to use the online system.

A login was required by the designated facility data coordinator to access online assessments or reports. The staff member began a session by entering the login and password, then had a client sit at the computer and answer questions. When a client completed the session or attempted to close the program, an automated prompt appeared requiring reentry of the staff members' password, thereby prohibiting access to their own or other clients' records. Multiple users could access the system synchronously using separate computer terminals, enabling staff to monitor several clients completing assessments simultaneously. Methods and procedures for collecting data were approved by the university Institutional Review Board (IRB).

Assessments were administered to all adolescent clients at two time points: at intake (approximate 1 hour completion time) and again at 30-60 days (30 minutes; note, General Risk and Drug Screen modules were administered only at Time 1, Engagement module was administered only at Time 2). Time windows for administration of the second survey were broadly defined to accommodate varying planned lengths of stay across the 8 facilities. Youth generally responded to items using the school computer lab located at the treatment facility. Youth were instructed to respond honestly to items, advised on the potential use of responses in treatment planning and the restriction of use of responses from determination of discharge planning. Short breaks were provided as needed with an automatic saving mechanism to avoid loss of data between sessions. Clinical staff were available to answer questions and monitor completion and proper use of the computer terminal. Items within the TCU-ASAP are worded at or below a 6th grade literacy level with built-in accuracy checks to monitor reading comprehension and attention during survey completion. An example accuracy item included, "Please fill in the 'Disagree' box as your response for this question." A small proportion of the youth responded inappropriately to both accuracy items (Time 1: 11%; Time 2: 6%) or terminated the assessment prior to completion of all modules (Time 1: 5%; Time 2: 2%).

The online system provided counseling staff real-time immediate access to feedback reports for individual clients including item responses and scale scores. Indication "flags" were also identified on the report when a client's score fell within the extreme 25th percentile of the sample (e.g., bottom 25% on desire for help; top 25% on depression). Clinical staff were encouraged to review the automated report for "flags" approximately 3 to 4 days after a

client completed the TCU-ASAP and to use the information to determine treatment objectives in the client's service plan or to justify additional diagnostic assessment. After 30 days, modules were repeated, changes in scores were documented, and service plans modified accordingly. In one program, clinical staff reviewed assessment reports with the client after the second administration, focusing on change from Time 1 to Time 2.

Clinical staff at each program received free training on understanding and interpreting items within each scale, interpreting scale scores, operating the online system, administering forms, printing and interpreting feedback reports, incorporating information into treatment plans, and documenting client progress over time. Clinical staff were advised that the TCU-ASAP is to be used as a screening system and that potential problems identified should be assessed further with a clinical assessment by a licensed psychologist/psychiatrist, or educational diagnostician. Technical assistance included ongoing support from the research center as requested by treatment staff and a weekly report indicating which clients were due for a Time 2 assessment.

Participants

The sample was drawn from 1189 adolescent clients who were admitted to residential substance abuse treatment at one of 8 participating programs. Of these 1189, 87% were seated at a computer terminal and began responding to questions on the TCU-ASAP; the remaining 13% of clients completed a paper-pencil version. Of the 1189 clients, 1075 (90%) completed the first assessment at intake (Time 1) and 570 (48%) completed the second assessment at 30-60 days (Time 2). Loss of Time 1 data was due primarily to scheduling issues (e.g., limited access to computers at some facilities early in the project) or early discharge within the first week of treatment. The lower completion rate for Time 2 assessments was due to a combination of treatment-specific factors (e.g., early discharge due to physical altercations, leaving against medical advice) and non-treatment factors (e.g., staff forgetting to schedule Time 2, shifting of responsibility for Time 2 assessments from one staff member to another).

Regarding sample characteristics, 70% of clients were male, and ages ranged from 13 to 19 years, with an average age of 15 ($SD = 1.06$). Thirty-nine percent were Hispanic, 31% white, 6% Black/African American, and 5% more than one race (19% did not report race). Marijuana was reported as the primary problem drug for 34% of the clients with 60% using daily, 20% using weekly, and 6% reporting monthly use. Alcohol and methamphetamine were identified as the primary problem drug for 11% and 10% of clients respectively (11% did not report problem drug). For those reporting alcohol as their problem drug, 22% reported using daily, 28% using weekly, and 23% using monthly. For those reporting methamphetamine as their problem drug, 41% reported using daily, 22% using weekly, and 8% reported using monthly.

Measures

The TCU Adolescent Screening and Assessment Package (see Appendix A) includes a collection of assessments used previously with adolescents, as well as adaptations of instruments originally developed for adults in treatment. In order to enable future

comparisons between adult and adolescent samples on CEST domains, the items comprising each adolescent subscale remained identical to the adult version. Minor modifications were made to some items to simplify language (e.g., “You sometimes feel resentful when you do not get your way,” was replaced with “You sometimes get mad when you do not get your way”), and some references to work or employment were replaced with references to school. For example, from the Problem Recognition scale, the item, “Your drug use is causing problems in finding or keeping a job” was replaced with “Your drug use is causing problems with school attendance.” For most domains, clients were asked to rate items on a 5-point rating scale (1 = disagree strongly, 2 = disagree, 3 = uncertain, 4 = agree, 5 = agree strongly). Items within each conceptual domain were averaged to form scale scores, and scale scores were recoded to range from 10 to 50. See Table 1 for a list of measurement domains, corresponding scales, and number of items in each scale.

Substance Use, Psychosocial Functioning, and HIV Risk—The TCU Drug Screen II (TCUDS II; Knight, Simpson, & Hiller, 2002) was used to assess substance use. The Drug Screen contains an index of 12 items assessing drug use severity based on the Diagnostic Statistical Manual (DSM) criteria for drug dependence (American Psychiatric Association, 2000). Based on the scoring criteria, the scale is reduced to 9 items. Frequency of drug use in the past 12 months was measured using a list of 13 drugs. The RISK form gathered demographic, school, and legal involvement information. Items assessed whether clients had been suspended or expelled from school, how often they cut classes, how important the client feels it is to get help with school, etc. Legal involvement questions included whether the client had been on probation, in drug court, or in juvenile detention within 30 days preceding treatment. Psychological and social functioning was assessed using the TCU Client Evaluation of Self and Treatment (CEST; see Garner, Knight, Flynn, Morey, & Simpson, 2007; Joe, Broome, Rowan-Szal, & Simpson, 2002).

Psychological Functioning is comprised of 5 scales that address self-esteem, depression, anxiety, decision making, and expectancy (regarding future drug use). Social Functioning includes 4 scales: hostility, risk taking, social support, and social desirability. The Social Desirability scale is a methodological scale measuring the extent to which individuals describe themselves in favorable terms in order to achieve the approval of others (Crowne & Marlowe, 1960). Items are re-coded (1 = Agree Strongly or Agree; 0 = Uncertain, Disagree, or Disagree Strongly) and summed, resulting in an index ranging in value of 0-11. Higher values indicate a potential for the client to respond how they feel the counselor would like for them to respond. Clinical interpretation of responses for youth with high social desirability scores should be made with caution. The TCU Family, Friends, and Self scales (FFS) were developed as a part of the Prevention Management and Evaluation System project (PMES; see Simpson & McBride, 1992) to evaluate the longitudinal aspects of inhalant use among a high-risk population of Mexican American youth. The FFS includes 6 scales assessing relationships with family and friends: family warmth, family control, family conflict, peer trouble (e.g., illegal activities), peer to family (e.g., parent interaction with peers), and peer socialization (e.g., pro-social activity).

HIV Risk is measured with 4 scales: risky drug use avoidance, risky sex avoidance, risk assertiveness, and self-knowledge, adapted from the TCU HIV Risk Assessment (Simpson

et al., 1994). Risky Drug Use Avoidance assesses confidence in the ability to avoid risky drug use situations. Risky Sex Avoidance assesses confidence in one's ability to avoid risky sexual situations and to use condoms. Risk Assertiveness assesses willingness to seek and get help with HIV concerns and testing including, and Self-Knowledge measures knowledge about risky situations, poor decision making, and HIV risks.

Treatment Motivation and Engagement—Motivation and engagement were assessed using the TCU Client Evaluation of Self and Treatment (CEST; see Garner et al., 2007; Joe et al., 2002). Treatment Motivation is comprised of 3 scales designed to measure client perceptions of their readiness for treatment: problem recognition, desire for help, and treatment readiness. Treatment Engagement includes 4 scales and assesses participation, satisfaction, and relationships established in treatment.

Judgment and Decision Making—To more fully understand judgment and decision-making processes among youth in substance abuse treatment, existing scales measuring criminal thinking were modified and scales addressing general thinking and thoughts about drug use norms and expectancies were adapted from existing literature. Three scales from the TCU Criminal Thinking Scales (CTS; see Knight et al., 2006) were adapted for adolescent populations: power orientation, cold-heartedness, and personal irresponsibility. Minor changes were made to account for placement of clients within community-based, non-juvenile justice settings, for instance, rewording “You are locked-up because you had a run of bad luck” to “You are in this program because you had a run of bad luck.”

Three scales address thinking around drug use: control over personal drug use, drug culture, and self-efficacy for resisting drug use. These were aimed at assessing client views of the “normalcy” of drug use among youth in general, and the degree to which youth feel they have the power to refrain from drug use. Control over Personal Drug Use measures the perceived degree of invincibility and control when using illicit drugs (derived from Wickman, Greenberg, & Boren, 2010). Drug Culture assesses the perceived social norms around drug use (derived from Osberg et al., 2010), and Drug Resistance Efficacy measures how confident an adolescent is regarding his/her ability to resist using drugs. It was derived from the Drug Use Resistance Self-Efficacy instrument (DURSE; Carpenter & Howard, 2009) and the Drug Abuse Treatment Outcomes Study (DATOS; Rounds-Bryant, Flynn, & Craighead, 1997).

Eight general thinking scales were included, several of which represent abbreviated adaptations of established instruments. Decisions regarding which items to retain were based on psychometric properties of scales as reported in the literature (i.e., items with highest factor loadings were retained). The Problem Solving Efficacy scale assesses the client's confidence in his or her ability to solve problems (Bandura, 2006). Assertiveness was also based on the work of Bandura (2006) and measures confidence and assertiveness of adolescents in both their actions and in expressing their opinions. The Invincibility scale (adapted from Wickman et al., 2010) assesses the degree to which adolescents feel invincible in risky situations. Optimism and Hope (Carver, Scheier, & Segerstrom, 2010) measures the expectation of positive outcomes and a hopeful future. Positive Urgency assesses the degree to which adolescents act rashly due to extreme positive emotions

(Cyders et al., 2007), whereas Negative Urgency assesses the degree to which adolescents act rashly due to extreme negative emotion (Whiteside & Lynam, 2001). Premeditation (Whiteside & Lynam, 2001) assesses the tendency to think before acting, and Attention (adapted from Dawson & Guare, 2010) measures the client's ability to pay attention when completing difficult tasks.

Analysis Plan—The central focus of the study was on documenting the psychometric properties of the scales for adolescent populations and providing means and quartiles by gender and age. In order to assess internal validity, principal components analysis (PCA) and confirmatory factor analysis (CFA) were conducted (based on Pearson correlations) for all the scales to examine dimensionality and separateness. In the PCA, an indicator of the number of dimensions of the matrix is the number of eigenvalues above 1.0 (Kaiser, 1961). CFA provides several indices of fit and includes the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and goodness-of-fit index (GFI). RMSEA scores of .08 or lower indicate reasonable fit while values exceeding .1 are considered poor fit. SRMR values of .08 or lower indicate acceptable fit (Hu & Bentler, 1998) while GFI values close to 1 indicate good fit. Cronbach's coefficient alpha was used to assess the internal reliability of each scale. This index of reliability provides a measure of consistency among the scale's items, where higher values indicate participants answered the items comprising each scale more similarly.

The analyses are presented in three parts. The first describes the psychometrics for the total sample. In the second part, consideration is given to the fact that the sample came from eight different treatment programs. Between-program differences were addressed in this section by removing the effects through the use of within-correlation matrices and re-computing the psychometrics based on these matrices. In the third section, cross-validation is considered through the splitting of the total sample into two random samples and re-running the analyses separately for each sample.

RESULTS

Psychometric Properties

Each scale and its psychometric properties for the total sample are presented in Table 1. This information includes the number of items comprising the scale, the sample size on which the analyses were done, the mean and standard deviation of the scale, the eigenvalues above 1 from the principal components analysis, and the fit indices from the confirmatory factor analysis.

Substance Use Severity—The Drug Use Severity scale was found to have a coefficient alpha of .82. There were two eigenvalues above 1, however, the second was only 1.05. In the confirmatory factor analysis, the RMSEA was above .08, but the SRMR was close to .05 and the GFI was .94. While these items together form a reasonable Drug Use Severity scale, scores are not typically reported as means. Instead, responses are assigned a 1 or 2, summed, and reported as an index (Knight et al., 2002) ranging from 9 to 18. Values of 12 or greater indicate relatively severe drug-related problems and correspond to DSM drug dependence criteria. In this sample, 566 of 1023 clients (55%) scored 12 or greater (drug use severity

remained un-scored for 5% of the sample due to insufficient response to the scale as a whole).

Psychosocial and Social Functioning—Cronbach's coefficient alpha indicated good reliability (above .70) for each of the psychological and social functioning scales. Alphas ranged from .75 to .83 for the psychological functioning scales and from .76 to .84 for the three social functioning scales. While the Social Desirability Scale is included with these scales and had a coefficient alpha of .69, it was developed as an indicator of response bias and scored as an index (see Method section). The principal components analyses provided evidence of the unidimensionality of the psychological functioning scales; only for Decision Making did a second eigenvalue prominently exceed 1.0. In contrast, results for the social functioning scales suggest that three might be multi-dimensional (Risk Taking, Social Support, and Social Desirability). The SRMR and GFI indices suggested good fits for the psychological functioning and social functioning scales (with the exception of Decision Making and Risk Taking), whereas the RMSEA fit index suggested that at least one item in most of the scales in these two domains was ill-fitting. The mixed fit is consistent with prior studies of adults who completed the CEST (Joe et al., 2002). Thus, an effort was made to improve the reliability and fit of these two scales. One item "You have trouble making decisions" (reverse coded) was excluded from the Decision Making scale. This resulted in some improvement as shown in Table 1 (original analysis: coefficient alpha = .75; RMSEA=.12 (.11, .13), SRMR=.087, GFI=.90; item-total correlation = .10; PCA loading = -.22). While the Risk Taking scale fit analyses suggested two factors, nevertheless, it had a satisfactory alpha reliability (.76). An inspection found that risk taking was comprised of two clusters of items, one addressed affinity for sensation seeking and the other not being safe and cautious. In keeping with the adult version of this scale, a single Risk Taking score is recommended for this construct with the understanding that it measures two aspects of risky activity.

Family, Friends, and Self—The coefficient alpha reliability was above .70 for five of the six FFS scales (.69 for Family Control). These alpha values are consistent with prior research (Simpson & McBride, 1992). Each of these scales had only one eigenvalue above one, providing support for them being considered one-dimensional. The SRMR and GFI fit indices indicated acceptable fits on all scales. However, the RMSEAs suggested again their sensitivity to at least one item not fitting the others on four of the scales. Because these scales were adapted from existing instruments, additional modifications were not explored.

HIV Risk—Psychometric analyses of the four HIV risk scales show them to be reliable and unidimensional. The coefficient alpha was above .76 for three of the four scales in this domain (the exception being Risk Assertiveness at .66) and there was only one eigenvalue above 1.0 for each principal components analysis. Because Risky Sex Avoidance and Risk Assertiveness were each comprised of only 3 items, fit indices were not available. Fit indices for Risky Drug Use Avoidance and Self Knowledge suggested good fits.

Treatment Motivation and Engagement—Cronbach's coefficient alpha indicated high reliability for each motivation scale. Problem Recognition and Desire for Help were found

to have only one eigenvalue above one. However, Treatment Readiness was found to have a second eigenvalue above 1.0, suggesting that this scale may be multi-dimensional. RMSEA indices were generally poor to moderate, suggesting some multidimensionality as reported previously (Simpson & Joe, 1993). These findings suggest that while the Treatment Readiness items all reflect a broad construct, there may be several dimensions of readiness that are captured within this set of items. Each of the four engagement scales had a coefficient alpha above .82. One item from the Treatment Participation and one from the Peer Support scale were removed due to poor fit (item – total correlations of $r = .11$ and $r = .02$, respectively). Incidentally, these items were the only 2 (out of 36 Engagement items) that were phrased in the negative to suggest poor engagement. The principal components analysis supported the unidimensionality of the engagement scales, with each having only one eigenvalue above 1.0. Similar to the other domains, the fit indices from the confirmatory factor analyses presented a more complex picture. The SRMR and GFI fit indices suggested fairly good fits, while the RMSEA suggested at least one item did not fit the hypothesis of unidimensionality. As with Treatment Readiness, these results suggest that there may be several dimensions of these engagement constructs represented within each scale.

Judgment and Decision Making—Three domains of judgment and decision making were addressed: criminal thinking (three scales), drug use thinking (three scales), and general thinking (eight scales). Each criminal thinking scale was generally reliable, with one exception being Personal Irresponsibility (Alpha=.63). This lower alpha is consistent with prior research (Knight et al., 2006). Each was unidimensional and had a good fit, as judged by all criteria. For two of the three drug use thinking scales, coefficient alphas were above .70, indicating high reliability for those two scales. The exception was Control over Personal Drug Use (Alpha = .65). In an effort to improve the reliability of the Control over Personal Drug Use scale, 2 items “My use of alcohol/drugs is not a problem unless I get caught” and “Alcohol/drug use doesn’t affect my ability to drive safely” were excluded. However, these deletions did not improve the reliability. The reliability for the reduced scale was .64. while the reliability was .65 with these two item included. The confirmatory factor analysis on the original five items indicated a very poor fit (RMSEA =.23). While confirmatory factor analysis could not be computed for the reduced Control over Personal Drug Use (3 items), the PCA suggested only one factor for these three items. The PCA suggested that the other two scales were unidimensional. RMSEA and SRMR fit indices were good for Drug Resistance Efficacy, but generally poor for Drug Culture. With regard to general thinking, the coefficient alphas were in the acceptable range of above .70 with the exception of Optimism and Hope (.56). The principal components analyses yielded more than one eigenvalue above 1.0 for three of the eight scales in the general thinking domain. These were Invincibility, Optimism and Hope, and Attention. The confirmatory factor analyses suggested that four of the scales had acceptable fits in terms of their RMSEAs. Overall, the SRMR was poor only for Optimism and Hope and Attention. Because these scales were adapted from existing instruments (Carver, Scheier, & Segerstrom, 2010; Dawson & Guare, 2010), additional modifications were not explored.

Sampling Issues

As noted in the Method section, the 1189 adolescents in the sample came from eight treatment programs. In order to address how samples from different treatment programs may have affected the psychometrics reported for the total sample, we computed a within-program covariance matrix and converted it to a correlation matrix for each scale. On each within-program correlation matrix, the coefficient alpha reliability analysis, principal components analysis, and confirmatory factor analysis were recomputed. These results are presented in Table 2. A comparison of the coefficient alphas based on the total sample in Table 1 (which included both between and within group variation) with the corresponding coefficient alphas based on the within-program correlation matrices (Table 2) show them to be highly similar with the exception of the scale measuring social support (.80 vs. .69) in the Social Functioning domain. Still, the within-program alpha of .69 would be considered fairly acceptable, as it is very close to the general accepted cutoff of .70. Results of the confirmatory factor analysis of each scale based on the within-program correlation matrix were also similar to the analysis based on the total sample (including the RMSEA, SRMR, and GFI fit indices). In contrast, PCA identified more item clusters in the within-program correlation matrix analyses than was found in the total sample analysis.

Cross-Validation

The analyses presented thus far provide the results based on the total sample of adolescents. To demonstrate the generalizability of the results, we explored the data from a cross-validation perspective. The total sample was randomly assigned into two subsamples based on generating a random number for each individual in the sample; this resulted in two samples (Time 1: 541 and 532; Time 2: both 285, after deletion of a few individuals with missing data). Coefficient Alphas and RMSEAs are presented in Table 3. In comparing the results of the random sample 1 with the results from the total sample provided in Table 1, coefficient alpha and RMSEA results correspond fairly closely. For coefficient alpha, there was only one scale with a large discrepancy (Peer Support), where the alpha was .82 in the total sample but only .71 in random sample 1. Otherwise, of the 40 scales, 15 had the same coefficient alpha between the total and random sample 1. Another 23 scales differed by .01-.03 between the two samples, and two differed by .05-.06. In comparing results of the two random samples (both in Table 3), the differences between corresponding coefficient alphas were generally very small. For 33 scales, the difference was .03 or less. Five scales had a difference of .04-.05. Differences were large for two scales (.09 for Assertiveness from the general thinking domain and .11 for Risk Assertiveness from the HIV risk domain).

From the perspective of the confirmatory factor analyses, differences in RMSEAs between the total sample and random sample 1 suggest the results were generally close. Of the 37 scales for which a confirmatory factor analysis was possible (scales with at least 4 items), 29 had RMSEAs that differed by less than .02; four had corresponding RMSEAs that differed by less than .03. The remaining four had differences between .03-.04. A comparison of the RMSEAs between the two random samples shows them to be equally close. Twenty-two had differences of .02 or less, eight had up to .04, and five had differences greater than .04.

Sample Norms

A figure representing the mid-50 percentile range values (25th percentile to 75th percentile) for the entire sample is provided in Appendix B. The mid-50% range provides the array of values where the middle 50% of the sample is likely to score. Depending on the particular domain, scores above the 75% mark or below the 25% mark indicate that the client scored relatively high or relatively low compared to peers, and suggests that further clinical diagnostics may be useful. For instance, a motivation score below the 25th percentile would be flagged, whereas a depression or anxiety score above the 75th percentile would be flagged. Figures depicting values for males, females, ages 13-15, and ages 16-18 are available at www.ibr.tcu.edu.

Gender and Age Differences

To examine potential gender and age differences, a series of 2 (gender) $\times$ 2 (age: younger [13-15]; older [16-18]) ANOVAs were conducted, with each scale score as the dependent variable. The main effects for gender and age are presented in Table 4. Interactions between gender and age were not statistically significant.

Gender differences—Analyses revealed significant gender differences on approximately half of the measures. For the psychological functioning scales, males reported higher self-esteem and decision making and lower depression and anxiety compared to females. Males and females were generally the same on social functioning measures with the exception that females reported higher risk-taking compared to males. With regard to family, friends, and self scales, males reported higher family functioning and peer socialization with higher scores on family warmth, peer to family, and peer socialization and lower scores on family conflict compared to females. Females tended to report greater HIV awareness, with higher scores on risky drug use avoidance, risky sex avoidance, risk assertiveness, and self-knowledge of HIV compared to males. Motivation and treatment engagement scores did not differ between males and females.

With regard to criminal thinking, males reported higher scores on power orientation and cold heartedness compared to females. There were no gender differences on the drug use thinking scales. For the general thinking scales, males tended to report lower assertiveness, higher premeditation, and higher attention compared to females. Females reported higher negative and positive urgency, indicating a tendency to act impulsively under the influence of negative and positive affect compared to their male counterparts.

Age differences—Age differences were found for one motivation scale (treatment readiness) and one psychological functioning scale (decision making), with older clients reporting higher treatment readiness and higher decision making compared to younger clients. For social functioning, two scales showed significant differences. Younger clients reported higher hostility and lower social desirability than older clients. Treatment engagement did not differ across age, and no age differences were observed on family, friends, and self measures. Older clients reported greater HIV awareness, with higher scores on risk assertiveness and self-knowledge compared to younger clients.

Younger clients reported more criminal thinking, with higher scores on power orientation and personal irresponsibility compared to older clients. For drug use thinking, younger clients reported more control over personal drug use compared to older clients. With regard to general thinking, older clients reported higher problem solving efficacy, premeditation, and attention compared to younger clients. Younger clients reported higher positive and negative urgency, indicating a greater tendency to act impulsively in response to positive and negative affect.

DISCUSSION

Summary of Results

The present study provided documentation on the psychometric properties of scales comprising the TCU Adolescent Screening and Assessment Package (TCU-ASAP). After minor modifications, they appear appropriate for use with youth in treatment. Overall, they have good reliability as measured by coefficient alpha, and most are unidimensional. Some gender and age differences exist, with females reporting more problems than males and younger adolescents reporting more problems than older youth. Gender differences are consistent with findings from both adolescent (e.g., Stevens, Estrada, Murphy, McKnight, & Tims, 2004) and adult samples (e.g., Mangrum, Spence, & Steinley-Bumgarner, 2006), and age differences are consistent with literature on developmental maturation (e.g., Bernstein & Waber, 2007). Older youth (ages 16-18) reported better decision making, greater confidence in their ability to solve personal problems, and better planning and sustained attention than their younger counterparts.

Conclusion regarding psychometric properties of the scales derives from three sets of analyses. In the first set, psychometrics were calculated on the total sample. In the second, between site differences were adjusted for through analyses on within-group correlation matrices. In the third, cross-validation was examined through splitting the total sample into two random samples. Given that many of the scales were based on existing adult scales and from existing youth scales, it was expected that some scales would show multi-dimensionality. Overall, the reliability coefficients for these scales in TCU-ASAP are generally in the satisfactory range and are consistent with those reported in previous studies (e.g., Cyders et al., 2007; Joe et al., 2002; Whiteside & Lynam, 2001). Multi-dimensionality found in the principal components analyses in some scales has been reported previously. The confirmatory factor analyses found that some scales had at least one ill-fitted item, but generally the SRMR and GFI indices were supportive. Only on one scale were all three fit indices in the “not good” range (RT). Disparity within some measures could be situational or due to varying interpretations. For instance, there could be several underlying sub-categories of a construct like “readiness” that are captured within the one scale – readiness to comply with program rules, readiness to work on personal issues, readiness to separate from family, etc. – some of which are highly variable depending on the client’s frame of mind. Regardless, internal consistency is high, indicating measures represent valid constructs and are appropriate for adolescents.

The results from the analyses eliminating between program differences were similar to those reported on the total sample. Additionally, the cross-validation analyses supported the

psychometrics found for the total sample and the within-correlation based analyses. Given that these scales are currently in use with other populations, the benefits of retaining all items in order to facilitate comparisons outweighs benefits of modifying scale composition to increase item fit.

Clinical Implications

This study provides an important step toward establishing the utility of a publicly available, modular screening and assessment system for adolescents. Built on established clinical tools for adults (Simpson et al., 2012), the TCU Adolescent Screening and Assessment Package incorporates language that is more appropriate for adolescent populations, taking into account their unique social and familial circumstances and involvement in school settings. Furthermore, the system includes expanded measures of social and cognitive functioning that are typically not assessed in rehabilitation settings, but that have important implications for treatment engagement and success. These include domains such as peer trouble, family control, impulsivity (negative and positive urgency), drug culture, attention, etc. Administration of modules to identify challenges in these areas can help counseling staff in their efforts to communicate effectively with clients and address maladaptive thinking and behavior. Given the substantial focus on cognitive-behavioral approaches and emphasis on productive decision making that occurs in most adolescent treatment environments, identifying problem areas in client thinking may prove useful in targeting services.

Screening and assessment tools can be incorporated as part of an adaptive treatment approach by having clients complete assessment instruments, producing summary reports that indicate potential problem areas, and using reports to place clients in specific groups with designated services to address specific needs. Adaptive treatment models can vary in terms of which needs are emphasized and addressed, how clients are scheduled for specified services, or whether assessment results are formally shared with clients, but they share in common the use of systematic criteria to determine client needs and tailor treatment to address those needs (Almirall, Compton, & Murphy, 2011; Marlowe et al., 2008; Murphy, Collins, & Rush, 2007).

Automated assessment systems can facilitate a move toward adaptive treatment by lessening the burden on staff (c.f., Pankow et al., 2012; Simpson et al., 2012). Such systems streamline assessment processing by enabling direct entry of responses onto a computer or through a scanned form, which is then immediately converted into individualized, printable reports for each client. Electronic data entry systems show promise both in terms of their ability to quickly convert client responses into clinically-relevant report formats and in terms of reducing constraints on staff time. One staff member can monitor multiple clients completing assessments simultaneously, as opposed to one-on-one interview formats that require dedicated staff time. Further work is needed to explore the benefits and challenges associated with various formats – i.e., computer-based operating system, or paper scanning options – as well as explore ways to overcome barriers and facilitate adoption of systematic assessment.

Limitations

While data from this study represent a wide range of adolescent clients admitted to residential substance abuse treatment, limitations to generalizability should be noted. First, all data are self-reported by adolescent clients within the first 2 weeks of entry into a residential program. It is possible that clients may have responded according to demand characteristics, offered inaccurate responses, or purposely responded inappropriately to questions. Consistency checks within the assessment system and systematic data cleaning procedures were incorporated to identify such response patterns, but some may have been inadvertently overlooked. Second, some data loss may have occurred due to unforeseen technical problems (that were corrected over time). Third, data represent only residential clients and cannot be generalized to other populations (i.e., outpatient). It should be noted, however, that although clients were sampled from eight different programs across the US, results were similar across programs, improving generalizability across residential settings. The sample, however, was limited in the number of Black/African Americans. Future research will need to reassess the current assessment package for adolescents in other treatment modalities and to address its applicability to Black/African Americans more clearly. Fourth, data herein do not address predictive validity. Future studies should examine the scales in relation to treatment retention and other outcomes. Finally, the assessment tools described in this study are not designed as diagnostic tools, but rather as screening instruments. Potential problems identified through these tools should be assessed further by a licensed psychologist/psychiatrist (in the case of clinical depression or other DSM diagnoses) or an educational diagnostician (in the case of thinking/attention issues) before a diagnosis is made (Tarter, 1990; Winters & Kaminer, 2008).

Conclusion

This study provides an important step toward adaptive treatment approaches by developing a modular based screening and assessment system for adolescents that incorporates language and measurement domains appropriate and important for adolescent populations. The system parallels one currently available for adults, and most importantly, facilitates systematic and objective measurement of personal issues that can inform treatment planning and aid in documenting progress. Not only does matching services to client needs have clear benefits for clients, but systematic assessment of client needs can also serve to inform clinical practice (c.f., Roberts, Redfield, Olson, Rawson, & Knight, 2010). A comprehensive client assessment system that documents change over time can be used to determine needs of the client population, identify whether services offered are consistent with population needs, and determine where gaps in services exist. Thus, client assessment is useful as an organizational change tool as well (Lehman et al., 2011).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TABLE 1

TCU-ASAP Scale Reliability

	Items	N	M	(SD)	Alpha	PCA Eigenvalues above 1	Confirmatory Factor Analysis		
							RMSEA (CI)	SRMR	GFI
Drug Screen II (DSII)									
Drug Use Severity	9	1023	5.63	(2.68)	.82	3.73, 1.05	.095 (.085, .106)	.058	.94
Psychological Functioning									
Self-Esteem	6	1063	33.93	(8.72)	.81	3.13	.076 (.059, .095)	.039	.98
Depression	6	1062	26.44	(8.64)	.80	2.99	.103 (.086, .121)	.050	.97
Anxiety	7	1062	28.97	(8.42)	.80	3.28	.115 (.102, .129)	.052	.94
Decision Making	8	1062	33.04	(7.03)	.78	3.25, 1.20	.095 (.083, .107)	.059	.95
Drug Use Expectancy	4	1062	37.60	(9.31)	.83	2.66	.158 (.124, .196)	.033	.97
Social Functioning									
Hostility	8	1060	28.19	(8.40)	.84	3.84	.101 (.089, .113)	.048	.95
Risk Taking	7	1057	33.83	(7.00)	.76	2.89, 1.50	.209 (.196, .223)	.128	.83
Social Support	9	1060	37.46	(6.58)	.80	4.21, 1.11	.083 (.073, .094)	.045	.95
Social Desirability	11	1061	4.46	(2.54)	.69	3.07, 1.66	.089 (.081, .097)	.076	.93
Family, Friends, and Self									
Family Warmth	7	1072	36.16	(9.40)	.89	4.40	.121 (.107, .135)	.034	.94
Family Control	6	1072	34.16	(7.17)	.69	2.39	.106 (.089, .124)	.057	.96
Family Conflict	5	1073	25.79	(9.44)	.85	3.14	.059 (.037, .085)	.021	.99
Peer Trouble	7	1073	34.14	(9.05)	.86	3.82	.146 (.132, .160)	.061	.91
Peer to Family	4	1072	31.28	(8.57)	.74	2.23	.132 (.098, .170)	.037	.98
Peer Socialization	6	1072	32.49	(7.64)	.80	3.00	.082 (.065, .099)	.032	.98
HIV Risk									
Risky Drug Use Avoidance	4	1031	40.79	(8.20)	.81	2.56	.084 (.049, .124)	.021	.99
Risky Sex Avoidance)	3	1033	38.01	(8.82)	.76	2.02	---	---	---
Risk Assertiveness)	3	1036	38.41	(8.35)	.66	1.79	---	---	---
Self-Knowledge	8	1032	37.57	(7.35)	.86	4.26	.059 (.047, .071)	.025	.98
Motivation									
Problem Recognition	10	1068	30.58	(9.27)	.89	5.13	.092 (.084, .101)	.044	.93

	Items	N	M	(SD)	Alpha	PCA Eigenvalues above 1	Confirmatory Factor Analysis		
							RMSEA (CD)	SRMR	GFI
Desire for Help	6	1068	33.60	(9.07)	.83	3.29	.155 (.138, .172)	.065	.93
Treatment Readiness	8	1068	32.52	(8.58)	.83	3.72, 1.11	.120 (.109, .132)	.065	.92
Engagement									
Treatment Participation	11	570	40.61	(6.08)	.92	6.00	.107 (.096, .118)	.051	.89
Treatment Satisfaction	6	567	38.67	(6.59)	.82	3.17	.131 (.107, .155)	.055	.94
Counseling Rapport	12	570	39.81	(6.38)	.94	7.46	.081 (.071, .092)	.034	.92
Peer Support	5	569	35.90	(7.45)	.82	2.89	.111 (.080, .144)	.035	.97
Criminal Thinking									
Power Orientation	7	1030	30.12	(7.66)	.82	3.36	.088 (.074, .103)	.041	.97
Cold Heartedness	5	1030	24.26	(7.33)	.75	2.52	.031 (.000, .061)	.017	.99
Personal Irresponsibility	6	1030	25.91	(6.91)	.63	2.12	.017 (.000, .049)	.023	.99
Drug Use Thinking									
Control over Personal Drug Use	3	1044	29.32	(9.13)	.65	1.76	---	---	---
Drug Culture	6	1051	27.43	(0.33)	.86	3.49	.228 (.211, .246)	.075	.88
Drug Resistance Efficacy	5	1040	36.49	(8.39)	.84	3.08	.068 (.045, .093)	.021	.99
General Thinking									
Problem Solving Efficacy	12	1040	35.21	(7.06)	.90	5.75	.081 (.074, .089)	.042	.94
Assertiveness	5	1038	37.60	(7.47)	.79	2.74	.047 (.023, .074)	.019	.99
Invincibility	6	1043	30.61	(6.98)	.75	2.69, 1.00	.120 (.103, .138)	.057	.96
Optimism and Hope	5	1043	31.44	(6.29)	.56	1.89, 1.38	.194 (.171, .218)	.107	.93
Positive Urgency	6	1049	26.65	(7.87)	.82	3.17	.056 (.039, .076)	.023	.99
Negative Urgency	6	1050	31.51	(8.44)	.83	3.28	.118 (.101, .136)	.044	.96
Premeditation	6	1051	30.71	(8.12)	.85	3.42	.076 (.058, .094)	.034	.98
Attention	5	1050	30.61	(7.84)	.71	2.33, 1.18	.198 (.175, .222)	.097	.93

* SAS proc calis does not provide fit indexes for scales with three items

TABLE 2

TCU-ASAP Scale Reliability based on Within-Correlation Matrices

	Items	N	α_w	PCA Eigenvalues above 1	Confirmatory Factor Analysis		
					RMSEA (CI)	SRMR	GFI
Drug Screen II (DSII)							
Drug Use Severity	9	1023	.81	2.48, 2.00, 1.16, 1.06	.096 (.086, .106)	.052	.94
Psychological Functioning							
Self-Esteem	6	1063	.81	2.52, 1.12	.076 (.058, .094)	.038	.98
Depression	6	1062	.79	2.74, 1.13	.104 (.086, .122)	.050	.97
Anxiety	7	1062	.80	2.11, 1.66, 1.16	.114 (.101, .129)	.052	.94
Decision Making	8	1062	.78	2.77, 1.34, 1.01	.092 (.080, .104)	.057	.95
Drug Use Expectancy	4	1062	.83	1.99, 1.13	.150 (.114, .188)	.032	.98
Social Functioning							
Hostility	8	1060	.84	2.61, 2.11, 1.23	.100 (.089, .112)	.048	.94
Risk Taking	7	1057	.75	4.18, 1.03	.209 (.195, .223)	.129	.83
Social Support	9	1060	.69	5.45, 1.10	.082 (.072, .093)	.045	.95
Social Desirability	11	1061	.69	5.22, 1.28	.089 (.081, .097)	.075	.93
Family, Friends, and Self							
Family Warmth	7	1072	.90	3.71, 1.31	.122 (.108, .136)	.034	.94
Family Control	6	1072	.69	2.13, 1.64	.106 (.088, .124)	.056	.96
Family Conflict	5	1073	.85	2.58	.056 (.032, .082)	.020	.99
Peer Trouble	7	1073	.86	2.68, 1.55, 1.18	.143 (.129, .157)	.059	.91
Peer to Family	4	1072	.74	1.91, 1.16	.127 (.092, .166)	.035	.98
Peer Socialization	6	1072	.80	1.61, 1.51, 1.39	.079 (.062, .098)	.031	.98
HIV Risk							
Risky Drug Use Avoidance	4	1031	.81	1.84, 1.35	.084 (.049, .124)	.021	.99
Risky Sex Avoidance	3	1033	.76	1.67, 1.33	--*	--	--
Risk Assertiveness	3	1036	.66	1.63, 1.37	--*	--	--
Self-Knowledge	8	1032	.87	3.32, 1.40, 1.01	.058 (.046, .071)	.025	.98
Motivation							
Problem Recognition	10	1068	.89	2.26, 2.14, 1.47, 1.09	.093 (.084, .102)	.045	.93

	Items	N	α_w	PCA Eigenvalues above 1	Confirmatory Factor Analysis		
					RMSEA (CI)	SRMR	GFI
Desire for Help	6	1068	.83	2.66, 1.25, 1.04	.153 (.136, .171)	.064	.93
Treatment Readiness	8	1068	.82	3.44, 1.50, 1.19	.122 (.110, .134)	.067	.92
Engagement							
Treatment Participation	11	570	.92	2.99, 1.90, 1.43	.106 (.098, .114)	.049	.90
Treatment Satisfaction	6	567	.81	2.33, 1.40	.119 (.102, .137)	.049	.95
Counseling Rapport	12	570	.94	3.19, 1.44, 1.39, 1.30, 1.06	.084 (.077, .092)	.034	.92
Peer Support	5	569	.81	1.79, 1.34, 1.13	.113 (.090, .137)	.035	.97
Criminal Thinking							
Power Orientation	7	1030	.81	2.56, 1.36, 1.13	.088 (.074, .102)	.041	.97
Cold Heartedness	5	1030	.75	1.64, 1.34, 1.03	.029 (.000, .058)	.016	.99
Personal Irresponsibility	6	1030	.63	1.66, 1.27, 1.10	.032 (.009, .053)	.024	.99
Drug Use Thinking							
Control over Personal Drug Use	3	1044	.64	2.18	---	---	---
Drug Culture	6	1051	.85	2.35, 1.75	.226 (.209, .243)	.076	.88
Drug Resistance Efficacy	5	1040	.79	1.70, 1.41, 1.07	.072 (.049, .097)	.022	.99
General Thinking							
Problem Solving Efficacy	12	1040	.90	2.46, 1.93, 1.45, 1.33, 1.12	.082 (.074, .089)	.042	.94
Assertiveness	5	1038	.79	1.67, 1.36, 1.28	.039 (.013, .069)	.017	.99
Invincibility	6	1043	.75	2.26, 1.52	.121 (.104, .139)	.057	.96
Optimism and Hope	5	1043	.56	3.35	.193 (.170, .217)	.106	.93
Positive Urgency	6	1049	.82	2.01, 1.46	.056 (.038, .075)	.023	.99
Negative Urgency	6	1050	.83	1.98, 1.77, 1.04	.119 (.102, .137)	.044	.96
Premeditation	6	1051	.84	2.86, 1.23	.075 (.058, .094)	.034	.98
Attention	5	1050	.70	3.08	.198 (.175, .222)	.097	.93

* SAS proc calis does not provide fit indexes for scales with three items

TABLE 3

TCU-ASAP Scale Reliability for Random Samples

	Items	Random Sample 1					Random Sample 2				
		N	M	(SD)	Alpha	RMSEA	N	M (SD)	Alpha	RMSEA	
Drug Screen II											
Drug Use Severity	9	519	5.67	(2.66)	.82	.100	504	5.50 (2.70)	.82	.086	
Psychological Functioning											
Self-Esteem	6	538	34.00	(8.39)	.78	.083	525	33.86 (9.05)	.83	.086	
Depression	6	537	26.43	(8.46)	.78	.107	525	26.46 (8.82)	.81	.105	
Anxiety	7	537	29.02	(8.18)	.79	.135	525	28.92 (8.67)	.82	.096	
Decision Making	8	537	32.70	(6.59)	.79	.084	525	33.05 (6.41)	.78	.103	
Drug Use Expectancy	4	537	37.84	(9.30)	.83	.193	525	37.36 (9.28)	.83	.130	
Social Functioning											
Hostility	8	536	27.98	(8.34)	.83	.095	524	28.41 (8.46)	.85	.111	
Risk Taking	7	533	33.64	(7.11)	.77	.215	524	34.02 (6.90)	.75	.203	
Social Support	9	536	37.52	(6.66)	.80	.083	524	37.41 (6.50)	.81	.086	
Social Desirability	11	537	4.35	(2.55)	.69	.088	524	4.58 (2.53)	.70	.089	
Family, Friends, and Self											
Family Warmth	7	541	36.09	(9.69)	.90	.124	531	36.24 (9.11)	.89	.121	
Family Control	6	540	34.11	(7.14)	.69	.088	532	34.22 (7.20)	.69	.128	
Family Conflict	5	541	25.79	(9.38)	.85	.057	532	25.79 (9.52)	.86	.072	
Peer Trouble	7	541	34.03	(8.78)	.86	.152	532	34.25 (9.33)	.86	.142	
Peer to Family	4	541	31.31	(8.55)	.73	.146	531	31.26 (8.61)	.75	.111	
Peer Socialization	6	541	32.64	(7.72)	.80	.067	531	32.35 (7.57)	.79	.087	
HIV Risk											
Risky Drug Use Avoidance	4	517	40.72	(8.10)	.78	.111	514	40.87 (8.32)	.83	.044	
Risky Sex Avoidance	3	518	37.95	(8.75)	.74	NA	515	38.07 (8.92)	.77	NA	
Risk Assertiveness	3	520	38.43	(8.06)	.60	NA	516	38.39 (8.66)	.71	NA	
Self-Knowledge	8	517	37.66	(7.08)	.85	.044	515	37.48 (7.61)	.88	.076	
Motivation											
Problem Recognition	10	539	30.68	(9.12)	.89	.093	529	30.49 (9.43)	.90	.103	

	Items	Random Sample 1					Random Sample 2				
		N	M	(SD)	Alpha	RMSEA	N	M (SD)	Alpha	RMSEA	
Engagement	Desire for Help	6	539	33.42	(9.20)	.83	.152	529	33.78 (8.94)	.83	.162
	Treatment Readiness	8	539	32.13	(8.73)	.83	.113	529	32.92 (8.42)	.82	.139
	Treatment Participation	11	285	40.45	(6.26)	.92	.141	285	40.77 (5.90)	.91	.098
	Treatment Satisfaction	6	283	38.62	(6.80)	.81	.157	284	38.71 (6.39)	.83	.139
	Counseling Rapport	12	285	39.82	(6.69)	.95	.082	285	39.80 (6.06)	.94	.127
Criminal Thinking	Peer Support	5	284	36.05	(7.37)	.81	.088	285	35.76 (7.55)	.82	.119
	Power Orientation	7	518	30.43	(7.49)	.80	.105	512	29.80 (7.83)	.83	.078
	Cold Heartedness	5	518	24.31	(7.28)	.74	.053	512	24.21 (7.39)	.76	.047
	Personal Irresponsibility	6	518	26.37	(6.99)	.60	.032	512	25.45 (6.81)	.65	.051
	Control over Personal Drug Use	3	529	29.29	(8.99)	.63	---	521	29.34 (9.27)	.66	---
Drug Use Thinking	Drug Culture	6	530	27.26	(9.44)	.86	.226	521	27.60 (9.22)	.86	.232
	Drug Resistance Efficacy	5	524	36.77	(8.07)	.82	.105	516	36.20 (8.71)	.86	.064
	Problem Solving Efficacy	12	524	35.30	(6.80)	.89	.091	516	35.12 (7.33)	.91	.083
	Assertiveness	5	522	37.72	(7.05)	.74	.063	516	37.49 (7.89)	.83	.055
	Invincibility	6	525	30.68	(7.08)	.74	.116	518	30.54 (6.89)	.76	.128
General Thinking	Optimism and Hope	5	525	31.58	(6.22)	.54	.184	518	31.32 (6.38)	.58	.203
	Positive Urgency	6	528	26.75	(7.90)	.82	.056	521	26.55 (7.86)	.82	.065
	Negative Urgency	6	529	31.48	(8.52)	.83	.129	521	31.53 (8.38)	.84	.106
	Premeditation	6	530	30.98	(8.29)	.86	.095	521	30.43 (7.95)	.84	.061
	Attention	5	529	30.46	(7.79)	.71	.182	521	27.11 (6.43)	.71	.214

TABLE 4

TCU-ASAP Scale Means by Gender and Age

	Gender			Age		
	Males		Females	13-15		16-18
	M (SD)			M (SD)		M (SD)
Drug Screen II						
Drug Use Severity	5.88 (2.55)	5.04 (2.87)		5.78 (2.57)	5.53 (2.75)	4.70*
Psychological Functioning						
Self-Esteem	34.66 (8.12)	32.24 (9.73)	17.71**	33.71 (8.56)	34.07 (8.82)	.13
Depression	25.30 (8.05)	29.08 (9.31)	44.96**	26.69 (8.49)	26.29 (8.73)	.10
Anxiety	27.76 (8.09)	31.76 (8.50)	53.48**	29.32 (8.65)	28.75 (8.28)	.40
Decision Making	33.25 (6.29)	32.03 (6.90)	7.97**	32.16 (6.32)	33.33 (6.57)	7.24**
Drug Use Expectancy	37.74 (8.96)	37.26 (10.06)	.59	37.51 (9.65)	39.66 (9.09)	.03
Social Functioning						
Hostility	28.04 (8.16)	28.57 (8.90)	.92	29.58 (8.61)	27.30 (8.15)	17.99**
Risk Taking	32.88 (6.77)	35.98 (7.01)	49.95**	34.17 (6.71)	33.60 (7.18)	.73
Social Support	37.49 (6.56)	37.37 (6.67)	.07	37.24 (6.43)	37.61 (6.68)	.73
Social Desirability	4.53 (2.62)	4.29 (2.33)	2.15	4.18 (2.53)	4.64 (2.53)	7.53**
Family, Friends, and Self						
Family Warmth	37.09 (8.73)	34.06 (10.51)	24.09**	36.14 (9.19)	36.18 (9.54)	.05
Family Control	34.12 (6.82)	34.24 (7.90)	.07	34.76 (7.11)	33.77 (7.18)	.56
Family Conflict	24.75 (8.86)	28.25 (10.31)	32.10**	26.20 (9.50)	25.56 (9.44)	.56
Peer Trouble	33.81 (8.89)	34.95 (9.34)	3.68	34.84 (8.97)	33.69 (9.10)	3.58
Peer to Family	31.81 (8.40)	30.04 (8.87)	24.09**	31.28 (8.34)	31.29 (8.73)	.05
Peer Socialization	32.83 (7.42)	31.69 (8.06)	5.05*	32.17 (7.78)	32.70 (7.68)	.87
HIV Risk						
Risky Drug Use Avoidance	40.18 (8.60)	42.13 (7.09)	12.58**	40.47 (8.34)	40.99 (8.11)	1.43
Risky Sex Avoidance	37.56 (8.92)	38.98 (8.56)	5.74*	37.15 (8.93)	38.56 (8.73)	6.92
Risk Assertiveness	37.64 (8.56)	40.13 (7.62)	20.07**	37.77 (8.30)	38.82 (8.37)	5.04*
Self-Knowledge	36.98 (7.64)	38.87 (6.47)	14.80**	36.82 (7.51)	38.04 (7.21)	8.19**
Motivation						

	Gender			Age		
	Males		Females	13-15		16-18
	M (SD)	M (SD)	F-value	M (SD)	M (SD)	F-value
Problem Recognition	30.40 (9.10)	31.03 (9.62)	1.03	30.05 (8.78)	30.92 (9.57)	2.50
Desire for Help	33.34 (9.06)	34.20 (9.05)	2.08	32.96 (8.73)	34.00 (9.27)	3.81
Treatment Readiness	32.58 (8.59)	32.42 (8.58)	.08	31.72 (8.41)	33.03 (8.66)	5.97*
Engagement						
Treatment Participation	40.49 (5.97)	40.86 (6.31)	.49	40.31 (5.88)	40.85 (6.24)	1.18
Treatment Satisfaction	38.65 (6.37)	38.70 (7.01)	.01	38.42 (6.56)	38.87 (6.61)	.65
Counseling Rapport	39.66 (6.41)	40.11 (6.31)	.65	39.83 (6.04)	39.79 (6.66)	0.00
Peer Support	35.97 (7.07)	35.78 (8.17)	.08	36.23 (7.29)	35.64 (7.59)	.91
Criminal Thinking						
Power Orientation	30.46 (7.33)	29.39 (8.32)	4.42*	31.28 (7.69)	29.37 (7.56)	16.29**
Cold Heartedness	25.03 (7.54)	22.57 (6.59)	25.25**	24.05 (7.27)	24.29 (7.37)	2.13
Personal Irresponsibility	26.18 (6.89)	25.34 (6.94)	3.26	26.75 (6.99)	>25.38 (6.81)	>10.34**
Drug Use Thinking						
Control over Personal Drug Use	29.35 (9.08)	29.23 (9.25)	.13	30.12 (9.10)	28.80 (9.11)	4.35*
Drug Culture	27.24 (9.11)	27.87 (9.79)	.51	27.46 (9.58)	27.42 (9.16)	.35
Drug Resistance Efficacy	36.16 (8.49)	37.19 (8.14)	3.32	36.08 (8.42)	36.75 (8.37)	1.79
General Thinking						
Problem Solving Efficacy	34.97 (7.16)	35.71 (6.85)	2.43	34.57 (7.15)	35.62 (6.99)	5.80*
Assertiveness	37.15 (7.69)	38.65 (6.87)	9.05**	37.33 (7.30)	37.78 (7.59)	1.32
Invincibility	30.50 (6.90)	30.89 (7.10)	.69	30.86 (6.89)	30.45 (7.04)	.68
Optimism and Hope	31.64 (5.99)	30.98 (6.92)	2.49	30.97 (6.15)	31.75 (6.37)	3.37
Positive Urgency	26.25 (7.64)	27.61 (8.31)	6.73**	27.36 (8.07)	26.20 (7.72)	4.63*
Negative Urgency	30.80 (8.39)	33.08 (8.38)	16.51**	32.21 (8.31)	31.06 (8.50)	3.86*
Premeditation	31.31 (8.10)	29.35 (8.04)	13.14**	29.92 (8.10)	31.21 (7.88)	5.48*
Attention	31.12 (7.64)	29.43 (8.15)	10.47**	29.76 (7.69)	31.15 (7.89)	6.90**

Note: Ns ranged from 708-742 for males, 311-329 for females, 399-418 for 13-15 yr-olds, and 623-657 for 16-18 yr-olds; Ns for engagement measures ranged from 375-378 for males, 192 for females, 254-255 for 13-15 yr-olds, and 313-315 for 16-18 yr-olds.