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Texas Christian University (TCU) Short Forms for Assessing Client Needs and Functioning in Addiction Treatment

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Abstract

The TCU Short Forms contain a revised and expanded set of assessments for planning and managing addiction treatment services. They are formatted as brief (1-page) forms to measure client needs and functioning, including drug use severity and history (TCUDS II), criminal thinking and cognitive orientation (CTSForm), motivation and readiness for treatment (MOTForm), psychological functioning (PSYForm), social relations and functioning (SOCForm), and therapeutic participation and engagement (ENGForm). These instruments facilitate optically-scanned data entry, computerized scoring, and rapid graphical feedback for clinical decisions. The present study (based on 5,022 inmates from eight residential prison treatment programs) examines evidence on scale reliabilities and measurement structures of these tools. Results confirmed their integrity and usefulness as indicators of individual and group-level therapeutic dynamics.

Keywords

Prison-based treatment; brief assessments; optical scoring; drug use severity; criminal thinking; treatment motivation and readiness; psychological functioning; social functioning; treatment engagement; TCU Treatment Process Model

INTRODUCTION

Two-thirds of all jail and prison admissions in the United States meet diagnostic criteria for substance use disorders, but only 11% receive addiction treatment while incarcerated (Center on Addiction and Substance Abuse, 2010). Evidence shows this treatment can be effective, especially when transitional care is included (Martin, Butzin, Saum, & Inciardi, 1999; Wexler, Melnick, Lowe, & Peters, 1999). Sorting higher severity inmates into higher intensity treatments adds further benefits to those services both in short-term (Knight, Simpson, & Hiller, 1999) and the long-term (Knight et al., in this volume). Early detection and treatment is critical (Knight, Flynn, & Simpson, 2008; Simpson & Knight, 2007), yet limited resources and funding instabilities in criminal justice (CJ) systems are major challenges to providing appropriate assessments and sustained treatments necessary for addressing public health and safety needs. Thus, affordable screening instruments are needed that can provide an inexpensive assessment of treatment needs for the purposes of strategic planning and budgeting. The intent of the present paper is to address the psychometrics of a set of brief instruments that can be used for this purpose.

Client assessment and monitoring are integral steps necessary for adapting addiction treatment to the risks and needs of clients, and for improving the quality of treatment (e.g., Allen & Matson, 1993; Simpson, 2006). This information is the foundation for treatment planning, including assessing risks and needs of clients, gauging progress while in treatment, and identifying needs for further treatment. For example, the TCU Drug Screen (TCUDS II) is a free, brief instrument keying on clinical and diagnostic criteria for substance use developed initially for CJ settings (Knight, Simpson, & Hiller, 2002). Comparisons with other screens show it to be highly accurate (Peters, 2000) and to have high predictive value, high indices of specificity and sensitivity, and good test-retest reliability (Knight et al., 2002). The TCU Client Evaluation of Self and Treatment (CEST-Intake version) is an example of an assessment that captures treatment process measures. It provides broad information on initial motivation and treatment readiness, psychological functioning, and social functioning. It is available in Spanish as well as English. For during-treatment information, these CEST scales can be expanded to include indicators of therapeutic engagement (Joe, Broome, Rowan-Szal, & Simpson, 2002). While original development and testing of the CEST scales were carried out in community-based treatment settings, they subsequently have been modified for a wide range of applications for CJ-involved drug users (e.g., Garner, Knight, Flynn, Morey, & Simpson, 2007; Joe, Rowan-Szal, Greener, Simpson, & Vance, 2010), including international settings (Simpson et al., 2009).

Additionally, for a CJ-based drug treatment population, measures of criminal thinking and cognitive orientations are highly pertinent for evaluating rehabilitation barriers and progress (e.g., Gendreau, Little, & Goggin, 1996; Gendreau, Goggin, & Law, 1997; Walters, 2002; Yochelson & Samenow, 1976). The TCU Criminal Thinking Scales (CTS) assessment therefore focuses on several domains of cognitive functioning related to criminal conduct (Knight, Garner, Simpson, Morey, & Flynn, 2006). Documenting reductions in drug use and criminal thinking over the course of treatment offers a positive sign that risks of reoffending are being reduced. Like the CEST, the CTS has been shown to have good psychometric properties in that all scales have acceptable factor structures, reliabilities, and goodness-of-fit coefficients across split-half samples (Knight et al., 2006).

While these assessments have been employed and demonstrated to be useful in both community and CJ-based treatment systems, there has been a movement among treatment providers in recent years favoring brief, targeted instruments focused on selective client needs and functioning as opposed to global evaluations. Providers also are advocating the need for assessment options that accommodate online or other automated data capture formats. Their desire is to have an efficient, evidence-based means for obtaining clinical information. With more timely data captured and summarized in a user-friendly format, frontline clinicians can become better positioned to plan and deliver services that meet “evidence-based” criteria.

Because single-page client assessments are optimal for these applications, a series of TCU instruments have been reformatted into separate 1-page optical-scanning forms that allow for quick data processing and clinical feedback. This approach offers treatment providers greater flexibility in selecting particular forms that meet their needs and that are comparatively low cost to administer and score. The core set of TCU assessments represented by the TCUDS II, CEST, and CTS forms have been adapted to this format and are being widely adopted in correctional systems, so it is important to revisit their psychometric characteristics. The present study therefore examines the latest versions of these instruments, referred to as TCU Short Forms and described below.¹

TCUDS II

The Diagnostic and Statistical Manual (DSM) diagnostic scale calculated from this drug use screening instrument includes 12 items in its first section for computing a composite score measuring pre-incarceration level of drug use severity. The classification criteria corresponding with drug use dependency follow DSM protocol by focusing on drug usage patterns, recurring consequences (social, emotional, and physical), and withdrawal symptoms. Any combination of three “affirmative responses” (out of the nine scores comprising this composite) yields a clinical diagnosis of dependency. Knight et al. (2002) summarized findings using the TCUDS based on 18,384 state prison inmates surveyed in 1999 at the time their incarcerations began. Its reliability index (coefficient alpha) was .89 and remained stable across race-ethnic and gender subgroups, and 30% of the sample was diagnosed as being dependent on alcohol or other drugs. Peters et al. (2000) compared the TCUDS with other screen tools and found it had one of the highest overall accuracy rates (82%) along with high positive predictive value (82%), specificity (92%), sensitivity (70%), and test-retest reliability (.95).

TCU Criminal Thinking Scales (CTSForm)

The TCU CTSForm is designed to measure criminal thinking and cognitive orientation, generally administered as a supplement to the intake and during-treatment assessments. Its six scales include Entitlement (EN), Justification (JU), Power Orientation (PO), Cold Heartedness (CH), Criminal Rationalization (RN), and Personal Irresponsibility (PI), representing core concepts with special significance in treatment settings for correctional populations. Items are answered using 5-point Likert-type ratings, with response options of 1 (disagree strongly), 2 (disagree), 3 (uncertain), 4 (agree), or 5 (agree strongly). Scores for each scale are calculated by averaging answers to its set of items and multiplying by 10 to recalibrate the range to be 10 to 50. A previous study of 3,266 inmates in prison treatment (Knight et al., 2006) shows the 7-item EN has a coefficient alpha reliability of .78. A sample item from this scale is “Society owes you a better life.” JU is measured by 6 items with a reliability of .75, and includes “When questioned about the motives for engaging in crime, you justify your behavior by pointing out how hard your life has been.” PO has 7 items and a reliability of .81. An item from this scale is “You like to be in control.” CH contains 5 items, has a reliability of .68, and an example from this scale (that is reversed scored) is “You worry when a friend is having a personal problem.” RN has 6 items with a reliability of .71, including “Bankers, lawyers, and politicians get away with breaking the law every day.” PI is measured by 6 items, with a reliability of .68. A sample item is “You are not to blame for everything you have done.” In addition to favorable coefficient alpha reliabilities, these scales have acceptable test-retest reliabilities (with measures taken within 2 weeks): EN (.69), JU (.70), PO (.81), CH (.66), RN (.84), and PI (.75).

TCU Client Evaluation of Self and Treatment (CEST) Scales

Generally acceptable internal consistency reliabilities have been found across diverse samples for the CEST scales, along with favorable construct validity demonstrated by confirmatory factor analyses. In the current study, single-page adaptations of these scales for independently measuring motivation (TCU MOTForm), psychological functioning (TCU PSYForm), social functioning (TCU SOCForm), and treatment engagement (TCU ENGForm) are examined.

¹A supplementary set of these new forms that focus on other indicators (e.g., trauma, mental and physical health) also have been developed and are examined in other articles included in this special volume (see Rowan-Szal et al., and Pankow et al., in this volume).

TCU MOTForm—Four stage-based scales (Simpson & Joe, 1993) contained in this form include Problem Recognition (PR), Desire for Help (DH), Treatment Readiness (TR), and Treatment Needs (TN). PR is a 9-item scale and has a reliability of .87. A typical item is “Your drug use is a problem for you.” DH contains 6 items with a reliability of .66 in community-based and CJ-based treatment samples. A sample item is “You are tired of the problems caused by drugs.” TR consists of 8 items, with reliabilities of .75 (community-based) and .80 (CJ-based), including “You want to be in drug treatment.” Finally, TN is a 5-item list of commonly perceived needs for treatment service elements (e.g., individual or group counseling, medical care, mental health, and education) desired by clients, and these can be customized according to particular program options and settings involved. A summed-score index can be calculated to represent level of need.

TCU PSYForm—Five different scales are measured in this form, including Self Esteem (SE), Depression (DP), Anxiety (AX), Decision Making (DM), and Expectancy of recovery (EX). SE contains 6 items, modeled after the Rosenberg Self-Esteem Scale (Rosenberg, 1962). It has been found to be reliable (coefficient alpha of .77 for community-based and .72 for CJ-based clients), and a sample item is “In general, you are satisfied with yourself.” DP is a 6-item scale, with a reliability of .77 for community-based and .71 for CJ-based clients. An item from this scale is “You feel hopeless about the future.” AX consists of 7 items (reliability of .77 and .75 for community and CJ-based clients, respectively). A typical item is “You have trouble concentrating and remembering things.” DM contains 9 items, with reliabilities of .75 (community-based) and .74 (CJ-based), including “You think about probable results of your actions.” EX is a recently developed scale consists of 4 items, with a reliability of .81 in a community treatment sample (Joe, Flynn, Broome, & Simpson, 2007). One of its reverse-scored items is “You are likely to relapse in the next few months.”

TCU SOCForm—Four scales comprise this form: Hostility (HS), Risk Taking (RT), Social Support (SS), and Social Desirability (SD). HS contains 8 items, has reliabilities of .80 for both community and CJ clients, and is represented by the item “You like others to feel afraid of you.” RT has 7 items with reliabilities of .77 (community-based) and .71 (CJ-based). An item from the scale is “You like to take chances.” SS is a 9-item scale and has reliabilities of .75 (community-based) and .74 (CJ-based). An example is “You have people close to you who motivate and encourage your recovery.” SD is a recently developed scale based on a subset of 11 items from the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) selected to test for effects of potential response bias. For the full 33-item version of the scale, the literature reported coefficient alpha reliabilities ranging from .73 to .88 (Paulhus, 1991).

TCU ENGForm—Four during-treatment engagement process scales measure Treatment Participation (TP), Treatment Satisfaction (TS), Counselor Rapport (CR), and Peer Support (PS). TP consists of 12 items and traditionally has a high scale reliability (.85 community-based and .86 CJ-based). An example is “You are willing to talk about your feelings during counseling.” TS is measured by 7 items and has reliabilities of .80 (community-based) and .79 (CJ-based). A typical item is “You are satisfied with this program.” CR is comprised of 12 items and usually has the highest reliability of all CEST scales (.92 in community-based and .93 in CJ-based). A sample item is “You trust your counselor.” PS is measured by 5 items, has reliabilities of .81 (community-based) and .77 (CJ-based), and includes “Other clients at this program care about you and your problems.”

METHOD

Eight of the largest residential prison-based treatment programs operating in two states located in the central and southwest regions of the U.S. were selected for this study. They

represented the first wave of large treatment programs to begin implementing selected elements of the TCU Short Forms while working collaboratively with the IBR staff on longitudinal research projects starting in 2008. All programs were classified as minimum security and operated as stand-alone treatment facilities, following modified therapeutic community principles delivered in three phases (orientation, treatment, and re-entry). Five programs were for males, including three representing regular treatment units (bed space ranging from 504 to 650) and two for special medical and mental health needs (with beds for 212 and 323). In addition, three female programs were included, two of which were regular treatment units (with beds for 240 and 612) and another operated to address special medical and mental health needs (288 beds). Planned length of stay varied for these eight programs. For the regular male programs, two were programmed for stays of 6 months and one for 12-to-24 months. The two male special needs programs had planned tenures of 6-to-12 months. The female programs operated within this time spectrum as well. Planned durations for special needs programs was 6-to-12 months, the one regular program was 6-to-9 months, and the third program had three different tenure tracks that depended on client severity (90 days, 6 months, and 12-to-24 months).

The total sample for the study consisted of 5,022 inmates participating in these eight prison-based treatment programs, including 3,025 males (60%) and 1,997 females (40%). Whites comprised 48%, Blacks (31%), and Hispanics (21%). Average age overall was 36 years, and weekly drug use before prison included alcohol (34%), marijuana (28%), crack cocaine (15%), cocaine alone (11%), illegal methadone (19%), heroin alone (9%), and other opiates (9%). The sample was diversified within and between the programs and therefore appropriate for studying properties of assessment instruments (see Rowan-Szal, Joe, Bartholomew, Pankow, & Simpson, in this volume, for further analysis of females and additional assessment forms).

The TCU Short Forms reported below were collected from inmates at four time points – Time 1 (intake), Time 2 (end of orientation), Time 3 (end of treatment), and Time 4 (re-entry, prior to release) – and 55% of the 5,022 treatment participants completed at least one administration of all six forms (and with another 28% completing five of the six). However, there was no mandated or standard assessment schedule across treatment sites, and there also were variations in the particular forms these programs chose to use. Program specialization and planned duration were determining factors in their administering of forms. Exceptions were that TCUDS II was completed only once (at intake, Time 1), and ENGForm for measuring during-treatment engagement was completed at subsequent time points, but not at intake. Furthermore, all eight prison treatments began data collection for this study at different dates, starting in November 2008 and ending in May 2010, so that not all inmates entering treatment had sufficient time in their programs to complete later administrations for some assessments (e.g., at Times 3 or 4). All available records for each form were used for analyses, resulting in sample sizes ranging from 5,022 for TCUDS II (from its one-time administration at intake) to 15,818 for TCU PSYForm (combined from multiple administrations over four possible time points).

Administration procedures

The TCU Short Forms were collected as part of an on-going internal evaluation by the existing treatment provider at each of the participating facilities. TCU Institutional Review Board (IRB) approval was obtained for the use of de-identified secondary data in this study. Procedurally, the forms were administered in small group settings (15 to 25 clients) by a treatment staff member, and usually took place within the same room where group process occurred and without the presence of security staff. The responsible staff member handed a form to the clients and then proceeded to read each item aloud. Clients were asked to respond to each item by filling in the most appropriate response on the form, but instructed

to leave blank items that they did not understand or feel comfortable answering. Completed forms were collected by the staff member who administered them. Records were forwarded to another staff member for processing, and de-identified client data were then forwarded to TCU staff using a password protected, secure file transfer protocol.

RESULTS

Psychometric findings for the forms are divided into three sections. The first focuses on coefficient alpha reliability, eigenvalues from the principal components analysis, and results of confirmatory factor analysis for each scale. Two coefficient alpha reliabilities are presented, one calculated from the total covariance matrix and one from the within covariance matrix. The latter (reported in parentheses) removes from alpha the effects that may occur due to inmates coming from different prisons. Finally, the ranges of coefficient alpha reliability values calculated on samples (i.e., total covariance matrix) from each of the eight prison sites were examined. (Reliabilities also were calculated across gender and race-ethnic subgroups, but because there were no significant variations these results are not reported.)

In the second section, normative data for scales are examined based on the means, standard deviations, quartiles (first, second, and third), and interquartile range (i.e., an indicator of the middle 50% spread). For comparisons of male and female distributions, data are restricted to intake (Time 1) because fewer during-treatment records were available from the smaller sample of females. Finally, predictive validity evidence from multiple regression analysis examining the relationships of intake measures with during-treatment engagement is addressed in the third section of results.

Major findings are summarized in tabular form. Overall means and ranges of scores across treatment program (including psychometric and distributional statistics) are presented in Table 1 for the drug screen index, measures of criminal thinking, motivation, psychological functioning, social functioning, and therapeutic engagement. Table 2 presents correlations of these assessments at intake with engagement measures recorded at Times 3 and 4, the basis for examining predictive validity of the scales.

In previous research of these scales in both community-based and corrections-based treatments, the CEST and CTS scales were examined not only in terms of their psychometric, but also with regard to their relationships to each other (Garner et al., 2007; Joe et al., 2002; Knight, Garner, Simpson, Morey, & Flynn, 2006; Simpson & Joe, 1993; Simpson, Knight, & Ray, 1993). In confirmatory factor analyses reported in those studies, the individuality of each scale was also established in relation to the other scales within the overall CEST and CTS domains. While composites of the domains might be useful as organizing structures and for making general statements concerning overall condition, it is the individual scales that provide clinically useful information concerning the strengths and weaknesses of the drug clients. For the present study, the emphasis is therefore on psychometrics and validity of the CEST and CTS scales in the new short forms.

Coefficient Alpha Reliabilities, Eigenvalues, and Confirmatory Factor Analysis

TCU Drug Screen—Coefficient alpha for the drug use severity index based on the total sample was .87 ($\alpha_w=.86$). The range (.84 – .89) shows the TCUDS II index to be highly reliable across the different prison facilities represented, and its high internal reliability was consistent for males (.86) and females (.87). A principal components analysis yielded two eigenvalues above 1 (4.50, 1.05), although the second value is small and not convincing evidence that a viable second measurement domain exists. From the confirmatory factor analysis, however, the corresponding goodness-of-fit measures were GFI (.88), CFI (.81),

SMSR (.068), and RMSEA (.16), indicating a possible second factor among the items. Because the TCUDS II is a composite index (based on alcohol and other drug use severity combined), there are potential sample by drug-specific symptoms contributing to this secondary factor.

Criminal thinking scales—All coefficient alpha reliabilities for the six CTS scales were in the acceptable range. For four – Entitlement (EN), Justification (JU), Power Orientation (PO), and Criminal Rationalization (RN), alpha values were at .80 or above from total covariances (and above .78 from within covariances). The alpha for Personal Irresponsibility (PI) was .73 ($\alpha_w = .72$) and for Cold Heartedness (CH) it was .67 ($\alpha_w = .65$). The range of alpha coefficients across samples for each scale fell in the acceptable range, with the possible exception of CH. The range of alpha was largest for CH (.61 to .70) and smallest for EN (.83 to .88) and PO (.79 to .84).

In the principal components analysis based on all CTS items, there were five eigenvalues above 1; in the analysis of item subsets for each scale, there was only one eigenvalue above 1. The confirmatory factor analysis provided strong support for the six scale structure for CTS. The overall CFA had a SMSR of .054 and a RMSEA of .049, indicating that a six factor structure best explained the interrelationships among items. Similar evidence was found when each CTS scale was analyzed separately. The SMSR was very small for all of the scales, with the largest being .055 for EN. The RMSEA results reiterated the “good fit” of the CTS scales, where five of scales had values below .08, the cutoff noted by the literature as representing a close fit.

Motivation scales—The first three tiered scales of this form – Problem Recognition (PR), Desire for Help (DH), and Treatment Readiness (TR) – represent the principal CEST motivation scales (Simpson & Joe, 1993). The TN index reflects the level of care-related needs. Total sample coefficient alpha reliabilities were high for PR ($\alpha_T = .90$; $\alpha_w = .89$), DH ($\alpha_T = .81$; $\alpha_w = .79$), and TR ($\alpha_T = .84$; $\alpha_w = .82$); the TN index had an alpha of .64 ($\alpha_w = .62$). Results compare favorably with those from previous CJ populations, and the range for coefficient alpha was largest for TN (.53 to .66) and tightest for DH (.77 to .82) and TR (.80 to .84). Structure of the motivation domain was supported by the confirmatory factor analysis (SMSR = .057 and RMSEA = .077). While the principal components analysis had five eigenvalues greater than 1 (10.89, 2.06, 1.43, 1.25, 1.02), the fifth was only marginally so, thereby suggesting a four factor solution is preferable. Also, when the motivation scales were considered individually, only a single eigenvalue above 1 resulted for each scale. From the confirmatory factor analysis, the evidence for good fits was less consistent. The SMSR findings suggested a good fit for PR (.037) and TN (.026), and fair fits for DH (.072) and TR (.056), while the RMSEA suggested a good fit for TN, a fair fit for PR (.085), and poor fits for DH (.158) and TR (.127). The lack of consistent scheduling for pre-admission collection of motivation data likely contributed to these results. The reason is that motivation and treatment readiness items have different meanings after treatment begins.

Psychological functioning scales—All five scales for this domain – Self Esteem (SE), Depression (DP), Anxiety (AX), Decision Making (DM), and Expectations for recovery (EX) – had satisfactory coefficient alpha reliabilities: SE ($\alpha_T = .76$; $\alpha_w = .75$), DP ($\alpha_T = .81$; $\alpha_w = .77$), AX ($\alpha_T = .85$; $\alpha_w = .82$), DM ($\alpha_T = .78$; $\alpha_w = .78$), and EX ($\alpha_T = .78$; $\alpha_w = .78$). These values are higher than those reported for previous CJ evaluation samples. In regards to consistency, the ranges for coefficient alpha were most diverse for SE (.67 to .81) and EX (.69 to .80), and least for AX (.79 to .82) and DM (.75 to .80). With respect to other analyses addressing the structure of this domain, principal components analysis identified five eigenvalues greater than 1, while confirmatory factor analysis also provided supporting evidence (SMSR = .08; RMSEA = .07). When each scale was considered individually, the

evidence was slightly mixed. Based on eigenvalues above 1 and SMSR values, for example, there was strong evidence for the structural integrity of SE, DP, AX, and EX, as each had only one eigenvalue above 1 and an SMSR of .05 or less. In contrast, DM had two eigenvalues above 1 as well as the largest SMSR; the RMSEA suggested good fits applied only to SE and AX.

Social functioning scales—The social functioning scales include Hostility (HS), Risk Taking (RT), Social Support (SS), and Social Desirability (SD), with the latter scale representing a measure of “need of approval” (Crowne & Marlowe, 1960, 1964) or “avoidance of disapproval” (Crowne, 1979). Because of what it purportedly measures, SD is viewed theoretically as a potential indicator of response bias. Coefficient alpha reliabilities were satisfactory for all four scales: HS ($\alpha_T = .84$; $\alpha_w = .83$), RT ($\alpha_T = .80$; $\alpha_w = .80$), SS ($\alpha_T = .83$; $\alpha_w = .82$), and SD ($\alpha_T = .75$; $\alpha_w = .73$). While the ranges across samples for the scales varied, alpha values were consistently good: HS (.81 to .85), RT (.74 to .82), SS (.78 to .85), and SD (.67 to .77). With regard to structure, principal components analysis yielded seven eigenvalues above 1, but two of these were very close to 1. Results of the overall confirmatory factor analysis reflected this variation as well, where the SMSR was .076 and the RMSEA was .072. When each scale was considered separately, the best fits emerged for SS (SMSR = .036, RMSEA = .077), HS (SMSR = .039, RMSEA = .089), and SD (SMSR = .060, RMSEA = .083). For RT, the fit was poorer (SMSR = .099, RMSEA = .19).

Engagement—Treatment Participation (TP), Treatment Satisfaction (TS), Counselor Rapport (CR), and Peer Support (PS) comprise the four scales for engagement. Coefficient alpha reliability of each scale was high: TP ($\alpha = .90$; range = .86 – .92; $\alpha_w = .90$), TS ($\alpha = .81$; range = .75 – .84; $\alpha_w = .81$), CR ($\alpha = .94$; range = .93 – .95; $\alpha_w = .94$), and PS ($\alpha = .82$; range = .77 – .84; $\alpha_w = .81$). Principal components analysis based on all engagement items yielded four eigenvalues above 1 and structures for these scales also were confirmed in the overall analysis (SMSR = .065, RMSEA = .063), especially when each scale was analyzed individually. In these, there was only a single eigenvalue above 1, and the confirmatory fit measures were good: TP (SMSR = .040, RMSEA = .081), TS (SMSR = .034, RMSEA = .076), CR (SMSR = .023, RMSEA = .060), and PS (SMSR = .013, RMSEA = .046).

Normative Data

TCU Drug Screen—The score range of the TCUDS II index is 0 to 9, with a score of 3 or higher indicating relatively severe problems and corresponding with a positive DSM drug dependence diagnosis. Therefore, the observed mean of 5.2 reflects a high degree of drug problem severity at intake for this treatment sample. The first quartile score was 3.0, revealing that 75% of inmates included in the present study would be classified as being “drug dependent.” Both genders had high degrees of severity but the sample of males ($n = 2,925$) reported lower average severity scores than females ($n = 2,002$). Males had a mean of 4.7 (with a first quartile score of 2.0), compared to a mean of 5.7 for females (with a first quartile score of 3.0). The same trend in scores held at both the second quartile (5.0 vs. 6.0) and third quartile (7.0 vs. 9.0).

Criminal thinking scales—Of the six criminal thinking scales, only the one for rationalization (RN) had a mean score above 25 (where lower scores in the 10–50 range suggest less severe criminal thinking). Comparisons of males and females on Time 1 data showed their differences were small, generally less than 1.5. (An exception was seen for cold heartedness (CH), on which males had a mean of 26.3 and females had a mean of 19.3.) These small mean differences also were generally reflected in score distributions as indicated across quartiles.

Motivation scales—Overall means for these scales were above 30 (the scale midpoint), ranging up to 40.3. For Time 1 (intake) data, males had lower means than females on three of the motivation scales; these included problem recognition (PR: 35.6 vs. 37.5), desire for help (DH: 40.2 vs. 42.0), and treatment needs (TN: 32.1 vs. 35.7). These differences were evident across the quartiles as well, where males were consistently lower than females on PR, DH, and TN. For treatment readiness (TR), quartiles scores for males and females were exactly the same.

Psychological functioning scales—Scores for psychological functioning showed self esteem (SE, 36.8), decision making (DM, 37.3), and expectations for recovery (EX, 41.4) had means above 30, and both depression (DP, 23.9) and anxiety (AX, 27.1) were below 30. The quartile information further supports these generally positive psychological functioning levels, as more than 75% had positive SE, DM, and EX scores. Furthermore, only about 25% had scores above 30 representing problems for DP and AX. Males generally reported less psychological dysfunction at intake than females; that is, they had higher scores on SE (35.4 vs. 33.1), DM (36.4 vs. 35.7), and EX (41.1 vs. 39.7), and males were much lower on depression (DP, 24.2 vs. 29.4) and anxiety (AX, 26.8 vs. 32.4). While these differences were evident in the quartiles across the scales, they were magnified for DP and AX where first quartile scores for males were equal to those in the second quartile for females. In other words, 50% of the males had scores below 23.3 on DP and 25.7 on AX, but females had only 25% below these two mean score values, respectively.

Social functioning scales—Means show that less than 25% of the treatment sample reported scores that reach 30 for hostility (HS) and only about half had scores over 30 on risk taking (RT). Overall, social support (SS) scores were high, with at least 75% having scores above 38. Males had lower mean scores than females on HS (24.1 vs. 25.3), RT (31.8 vs. 33.0), and SS (40.9 vs. 42.1), but were higher on SD (31.4 vs. 29.4). Quartile scores also reflected these gender differences.

Engagement—For the engagement scales, means for treatment participation (TP, 42.0) and counseling rapport (CR, 40.0) were high (in the “agree” range), while treatment satisfaction (TS, 36.0) and peer support (PS, 37.3) were lower although still above 30. Overall, the distribution of scores was favorable for each scale, with the second quartile being at least 40 for TP and CR, and above 35 for TS and PS. The quartiles also show at least 75% of the sample had a score of 40 or above on TP. In contrast, only 25% had scores this high on TS or PS. Gender differences on these scales were small and inconsistent.

Predictive Validities

Previous research shows measures of drug use problems, criminal thinking, motivation, psychological functioning, and social functioning at intake are related to treatment related needs and prognosis. Therefore, correlations of Time 1 client scores on these scales with Time 3 and 4 during-treatment measures of engagement were examined in the current study. As presented in Table 2, each predictor scale from Time 1 measures was found to be correlated consistently with treatment engagement, but of modest magnitude in most cases. As a group, the motivation scales were significantly related to during-treatment engagement, particularly TR and DH, where they typically had correlations in the .20 to .30 range. The SS scale from the social functioning domain also had comparable correlations. Some relationships of the criminal thinking scales were of the same magnitude, with EN and PI showing the most negative associations with engagement. This set of correlation coefficients was adjusted statistically for possible bias due to social desirability (i.e., using SD scores representing higher need for approval), but this adjustment did not change the significance or magnitude of relationships between the other domain measures across time.

Collectively, TCU Short Form intake scores predicted 21% of overall variance in engagement during treatment, as indicated by multiple regression based on treatment participation (TP) at Time 3 [$F(20, 1472) = 19.92, p < .0001, R^2 = .21$]. When considered in a stepwise model, nine predictor variables were statistically significant, accounting for 20.9% of the variance in treatment participation [$F(9, 1483) = 43.45, p < .0001, R^2 = .209$]. These predictors included three scales representing criminal thinking (PO, CH, and PI), three from motivation (DH, TR, and TN), one from psychological functioning (EX), and two from social functioning (HS and SS).

These results are summarized graphically in Figure 1, showing mean score profiles for separate samples of males and females from two of the large regular treatment prison programs included in this study. Subsamples of males and females were defined as low participation (LoP; scores 10–40) versus high participation (HiP; scores 46–50) and then compared on the basis of motivation scores (M:DH, M:TR, and M:TN) and criminal thinking scores (C:PO, C:CH, and C:PI), representing six of the significant predictor variable domains identified from the regression results reported above. The chart illustrates that higher levels of treatment participation (TP) were observed among clients whose motivation scores were higher at intake, and whose criminal thinking orientation was lower. Within the “high participation” subgroups, females reported higher motivation and less criminal thinking than males. Although they are not charted, virtually the same results were found in relation to the engagement indicator for establishing counselor rapport (CR) with clients.

By summarizing client-level information in this graphic fashion, care planning and monitoring of changes in scores over time are often facilitated. This is the purpose of the clinical feedback reports that can be generated from each TCU Form. More specifically, scores for individual clients can be compared by using the normative data presented earlier as a context for interpreting relatively high or low assessment score results.

DISCUSSION

In this paper, a new set of 1-page forms containing the most widely used TCU assessment scales for clients in addiction treatment were evaluated with respect to their psychometric properties and normative attributes. It was important to do so in a representative CJ-based treatment setting with real-world challenges related to noncompliant inmates, often assigned to mandated treatment. The reconfigured CEST scales in particular have been previously administered in a single comprehensive instrument containing intermingled items from all scales. Because of the growing number of users interested in applications of new optical-scanning and scoring protocols, especially in the CJ field, it was judged to be necessary to reexamine them in their new single-page formats where items measure substantive domains of scales separately. Overall psychometric evidence for these revised 1-page forms was positive, and their collective integrity has not been diminished from the comprehensive administration format used previously. Comparisons with the Addiction Severity Index (ASI; McLellan et al., 1992) also show they offer broader coverage and greater flexibility for CJ-based applications (Pankow, Simpson, Joe, Rowan-Szal, & Meason, in this volume).

A diversified sample of correctional treatment programs located in two states was selected as the basis for this study. They are similar to addiction treatment services frequently provided in CJ systems nationwide and included over 5,000 inmates. Results showed that the items comprising the TCUDS II (now being used as the primary CJ-based drug use screening tools in several states across the U.S.) were internally consistent as represented by its high coefficient alpha reliability. That is, different items comprising the scale are correlated with one another; the lowest item correlation with the total was .47, and seven

items had item-total correlations above .60. This replicates findings from other studies in the literature (e.g., Knight et al., 2002). Modest goodness-of-fit indices resulting from the confirmatory factor analysis, however, suggested the DSM criteria used for making a diagnosis of “dependence” might represent more than one dimension. This is not surprising considering that several different categories of psychoactive substances considered simultaneously (opioids, alcohol, stimulants, depressants, psychedelics, marijuana), and some symptoms of dependency do not apply equally well for all substances. Nevertheless, this scale exhibits a strong core factor that complies with the clinical goal of identifying individuals who have impaired control over psychoactive substances and who continue use despite adverse consequences. The underlying DSM criteria tap into cognitive, behavioral, and physiologic symptoms, and a diagnosis is determined from the count of indicators exceeding a clinical threshold.

Findings related to the TCU Criminal Thinking Scales (CTS) likewise extend previous support for using this assessment as reported by Knight et al. (2006). Coefficient alpha reliabilities were higher in the present study and goodness-of-fit indices from confirmatory factor analysis of each scale supported these scales. The present sample reported slightly lower levels of criminal thinking than found in previously surveyed CJ populations, and score differences between males and females were small with an exception for cold heartedness where males tended to score higher than females. All six scales measured at intake were correlated significantly with subsequent measures of treatment engagement and process, consistent with previous findings from CJ-settings in the U.S. as well as England (Best, Day, Campbell, Flynn, & Simpson, 2009). Scales with the strongest predictive relationships (negative) represented attitudes of entitlement and personal irresponsibility, identifying challenges that should be addressed by cognitive rehabilitation interventions.

Central to the TCU Treatment Process Model (Simpson, 2004) are the constructs represented by client motivation and readiness for treatment. The three major pre-treatment readiness stages represented by problem recognition, desire for help, and treatment readiness scales were each found to have high coefficient alpha reliabilities, and these matched or exceeded those previously reported in the original CEST format for community-based treatment clients (Joe et al., 2002) as well as for CJ-treatment clients (Garner et al., 2007). Results from the SMSR index suggested good to fair fits for these scales and principal components analysis for each suggested a single factor is represented as originally theorized (Simpson & Joe, 1993).

The set of psychological functioning scales also represents important client background attributes that impact treatment engagement. Coefficient alpha reliabilities were satisfactory for these scales, and they were even higher than previously reported for CJ populations (Garner et al., 2007) or community-based clients (Joe et al., 2002). Both the principal components analyses and the confirmatory analyses pointed towards favorable construct validity, and the normative information was highly consistent with previous results for CJ populations. For indicators of social functioning, coefficient alpha reliabilities for all scales were satisfactory, with hostility and risk taking both showing higher reliabilities than reported previously. While hostility and social support had acceptable goodness-of-fit indices, the evidence for risk taking and social desirability suggested more than one dimension might be measured by each scale. Finally, the four scales comprising during-treatment engagement (representing participation, satisfaction, rapport, and peer support) had favorable psychometric characteristics, including high coefficient alpha reliability and evidence for unidimensionality from confirmatory factor analysis.

Applications of TCU Short Forms

A statistical evidence base is necessary to support using the TCU assessments, but it is equally important that they have practical utility as clinical tools. Prison population provided a tough but key target for testing their applications. Normative (i.e., comparative) distributions therefore have been addressed along with their scientific properties. To assist in interpreting a scale score in relation to percentile values calculated from reference groups (i.e., for making comparative interpretations), gender differences also were reported. On average, male inmates had lower drug severity (TCUDS II) scores than females and were lower on treatment motivation indicators. Continuing this trend, males also had more favorable psychosocial functioning scores than females as indicated by higher self esteem, decision making, and expectations as well as lower levels of depression, anxiety, hostility, risk taking. These findings reflect a wider pattern of specialized trauma-based needs of women in CJ-based treatment as reported in more detail by Rowan-Szal et al. (in this volume).

Within both genders, this study included inmates housed in regular as well as special needs programs for medical and mental health problems. As expected, females in a special needs treatment facility were higher in psychological dysfunction (i.e., lower self esteem and expectancy for recovery, and higher depression and anxiety) than females in a regular unit located in the same state correctional system. They likewise reported higher scores on drug use severity at intake, treatment needs, hostility, risk taking, and criminal thinking. During treatment, their program satisfaction and perceptions of peer support were lower. Similar differences were found between males in special needs units versus those in regular units (based on comparisons using two special needs and two regular units for males, all located in the same state).

These within-gender subgroup differences observed in relation to special needs inmates help to underscore the value of developing specialized norms for making comparative interpretations of inmate needs and treatment progress. Indeed, as numbers of assessments accumulate in a treatment system or facility (and especially for specialized treatment groups) it is recommended that they be used to define normative profiles for improving site-specific treatment review and planning. To do so, fairly large sample accruals are necessary. This has been the practice implemented at the prison-based treatment programs included in this study where at least 100 client scores for each scale is required as a minimum for computing a facility-specific mean score, along with quartile distributions that define the 25th and 75th percentile score values. These statistics can be updated and stabilized using larger samples as they become available over time, providing a more confident interpretative framework for identifying extreme scale scores. Examples and computational guides for creating graphical feedback to summarize these results for clinicians are available (see Simpson & Bartholomew, 2008).

While sample sizes for the present study were large, a limitation is that they came from a smaller number of treatment programs than included in previous psychometric analyses of the TCU assessments. Current data were collected from eight treatment program sites, whereas previous studies of these scales were based on 87 programs in the community-based analyses and 26 in the CJ analyses. In those studies, the large number of programs allowed computations of “program-level” coefficient alpha reliabilities. Two alternative forms of coefficient alpha reliabilities were computed in the present study and the results suggest that between-program variations did not make much of a difference. Collectively, the evidence supports measurement credibility for the TCU assessments regardless of the administration format used.

Finally, predictive validity for the revised TCU Short Forms was highly favorable, showing Time 1 (intake) measures of client needs and readiness to be significantly associated with subsequent during-treatment engagement levels. The finding for motivation, for instance, reiterated similar results from previous research based on community (e.g., Joe, Simpson, & Broome, 1998, 1999; Simpson & Joe, 1993; Simpson, Joe, & Rowan-Szal, 1997) as well as CJ treatment samples (Lowmaster, Morey, Baker, & Hopwood, 2010). Likewise, indications of high hostility (from the social functioning scale) were comparable to results in earlier studies calling for targeted attention to reduce destructive program impact from hostile clients (e.g., Hiller, Knight, Saum, & Simpson, 2006; Joe et al., 1999; Stanton-Tindall et al., 2007). Other research offers similar findings wherein a composite measure defined as “externalizing problems at intake” (a combination of risk taking, hostility, and poor decision making scale scores) was shown to predict rules infractions in CJ settings (Lowmaster et al., 2010). Having reliable and affordable assessments such as these represents an essential element in the delivery and monitoring of addiction treatment services.

Concluding Comments

The new formulation of TCU Short Forms matches the favorable psychometric qualities of previous versions. When used to evaluate client problems and progress over time, treatment intake information accounted for a significant amount of variance in treatment engagement measures obtained 3 months later, as predicted in the TCU Treatment Process Model. Effective, brief, and less expensive tools have long been a goal for assessments in community-based drug abuse treatments, and these qualities are even more significant in the growing but financially strapped needs of drug treatment providers for correctional populations. In part, this is because CJ-based programs often must evaluate and process large numbers of court, jail, or prison admissions with limited resources. Intense treatment programs are costly, so it is important to identify inmates who can be best served by referrals to appropriate levels of therapeutic services. The efficiency of TCU assessments in field settings (e.g., Lowmaster et al., 2010) and the practical integration of targeted assessments with interventions (e.g., Roberts, Redfield, Olson, Rawson, & Knight, 2010) are offering more workable and affordable solutions for treating offenders with addiction problems.

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References

- Allen GB, Mattson ME. Psychometric instruments to assist in alcoholism treatment planning. *Journal of Substance Abuse Treatment*. 1993; 10(3):289–296. [PubMed: 8315703]
- Best D, Day E, Campbell A, Flynn PM, Simpson DD. Relationship between drug treatment engagement and criminal thinking style among drug-using offenders. *European Addiction Research*. 2009; 15(2):71–77. [PubMed: 19142006]
- Center on Addiction and Substance Abuse. *Behind bars II: Substance abuse and America’s prison population*. New York: National Center on Addiction and Substance Abuse at Columbia University; 2010.

- Crowne, D. *The experimental study of personality*. Hillsdale, NJ: Erlbaum; 1979.
- Crowne DP, Marlowe D. A new scale of social desirability independent of psychopathology. *Journal of Counseling Psychology*. 1960; 24:349–354.
- Crowne, DP.; Marlowe, D. *The approval motive*. New York: Wiley; 1964.
- Garner BR, Knight K, Flynn PM, Morey JT, Simpson DD. Measuring offender attributes and engagement in treatment using the Client Evaluation of Self and Treatment. *Criminal Justice and Behavior*. 2007; 34(9):1113–1130.
- Gendreau P, Little T, Goggin C. A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology*. 1996; 34(4):575–607.
- Gendreau P, Goggin C, Law MA. Predicting prison misconducts. *Criminal Justice and Behavior*. 1997; 24(4):414–431.
- Hiller ML, Knight K, Saum CA, Simpson DD. Social functioning, treatment dropout, and recidivism of probationers mandated to a modified therapeutic community. *Criminal Justice and Behavior*. 2006; 33(6):738–759.
- Joe GW, Broome KM, Rowan-Szal GA, Simpson DD. Measuring patient attributes and engagement in treatment. *Journal of Substance Abuse Treatment*. 2002; 22(4):183–196. [PubMed: 12072163]
- Joe GW, Flynn PM, Broome KM, Simpson DD. Patterns of drug use and expectations in methadone patients. *Addictive Behaviors*. 2007; 32:1640–1656. [PubMed: 17218066]
- Joe GW, Rowan-Szal GA, Greener JM, Simpson DD, Vance J. Male methamphetamine-user inmates in prison treatment: During-treatment outcomes. *Journal of Substance Abuse Treatment*. 2010; 38:141–152. [PubMed: 19801177]
- Joe GW, Simpson DD, Broome KM. Effects of readiness for drug abuse treatment on client retention and assessment of process. *Addiction*. 1998; 93(8):1177–1190. [PubMed: 9813899]
- Joe GW, Simpson DD, Broome KM. Retention and patient engagement models for different treatment modalities in DATOS. *Drug and Alcohol Dependence*. 1999; 57(2):113–125. [PubMed: 10617096]
- Knight, K.; Flynn, PM.; Simpson, DD. Drug court screening. In: Hardin, C.; Kushner, JN., editors. *Quality improvement for drug courts: Evidence-based practices*. Monograph Series. Vol. 9. Washington, DC: National Drug Court Institute; 2008. p. 3-12.
- Knight K, Garner BR, Simpson DD, Morey JT, Flynn PM. An assessment for criminal thinking. *Crime & Delinquency*. 2006; 52(1):159–177.
- Knight K, Simpson DD, Hiller ML. Three-year reincarceration outcomes for in-prison therapeutic community treatment in Texas. *The Prison Journal*. 1999; 79(3):337–351.
- Knight, K.; Simpson, DD.; Hiller, ML. Screening and referral for substance-abuse treatment in the criminal justice system. In: Leukefeld, CG.; Tims, FM.; Farabee, D., editors. *Treatment of drug offenders: Policies and issues*. New York: Springer; 2002. p. 259-272.
- Lowmaster SE, Morey LC, Baker K, Hopwood CJ. Structure, reliability, and predictive validity of the Texas Christian University Correctional Residential Self-Rating Form at Intake in a residential substance abuse treatment facility. *Journal of Substance Abuse Treatment*. 2010; 39:180–187. [PubMed: 20598835]
- Martin SS, Butzin CA, Saum CA, Inciardi JA. Three-year outcomes of therapeutic community treatment for drug-involved offenders in Delaware: From prison to work release to aftercare. *The Prison Journal*. 1999; 79(3):294–320.
- McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, Pettinati H, Argeriou M. The fifth edition of the Addiction Severity Index. *Journal of Substance Abuse Treatment*. 1992; 9:199–213. [PubMed: 1334156]
- Pankow J, Simpson DD, Joe GW, Rowan-Szal GA, Meason P. Examining concurrent validity and predictive utility for the Addiction Severity Index and Texas Christian University (TCU) Short Forms. *Journal of Offender Rehabilitation*. (in this volume).
- Paulhus, DL. Marlowe-Crowne Social Desirability Scale (MCSD). In: Robinson, JP.; Shaver, PR.; Wrightsman, LS., editors. *Measures of personality and social psychological attitudes: Volume 1. Measures of Social Psychological Attitudes Series*. San Diego, CA: Academic Press; 1991.
- Peters RH. Effectiveness of treatment-based drug courts in reducing criminal recidivism. *Criminal Justice and Behavior*. 2000; 27(1):72–96.

- Roberts, E.; Redfield, P.; Olson, D.; Rawson, R.; Knight, K. *Corrections Today*. Alexandria, VA: American Correctional Association; 2010. Designing a national model meth program; p. 52-57.
- Rosenberg M. Self-esteem and concern with public affairs. *Public Opinion Quarterly*. 1962; 26:201–211.
- Rowan-Szal GA, Joe GW, Bartholomew NG, Pankow P, Simpson DD. Brief trauma and mental health assessments for female offenders in addiction treatment. *Journal of Offender Rehabilitation*. (in this volume).
- Simpson DD. A conceptual framework for drug treatment process and outcomes. *Journal of Substance Abuse Treatment*. 2004; 27(2):99–121. [PubMed: 15450644]
- Simpson DD. A plan for planning treatment. *Counselor: A Magazine for Addiction Professionals*. 2006; 7:20–28.
- Simpson, DD.; Bartholomew, NG. Using client assessments to plan and monitor treatment. Fort Worth: Texas Christian University, Institute of Behavioral Research; 2008. Available online: www.ibr.tcu.edu
- Simpson DD, Joe GW. Motivation as a predictor of early dropout from drug abuse treatment. *Psychotherapy*. 1993; 30(2):357–368.
- Simpson DD, Joe GW. A longitudinal evaluation of treatment engagement and recovery stages. *Journal of Substance Abuse Treatment*. 2004; 27(2):89–97. [PubMed: 15450643]
- Simpson DD, Joe GW, Rowan-Szal GA. Drug abuse treatment retention and process effects on follow-up outcomes. *Drug and Alcohol Dependence*. 1997; 47(3):227–235. [PubMed: 9306048]
- Simpson, DD.; Knight, K., editors. *Criminal Justice and Behavior*. Vol. 34. 2007. Offender needs and functioning assessments (Special Issue); p. 1105-1234.
- Simpson DD, Knight K, Ray S. Psychosocial correlates of AIDS-risk drug use and sexual behaviors. *AIDS Education and Prevention*. 1993; 5(2):121–130. [PubMed: 8323854]
- Simpson DD, Rowan-Szal GA, Joe GW, Best D, Day E, Campbell A. Relating counselor attributes to client engagement in England. *Journal of Substance Abuse Treatment*. 2009; 36(3):313–320. [PubMed: 18835675]
- Stanton-Tindall M, Garner BR, Morey JT, Leukefeld C, Kreitemeyer J, Saum CA, Oser CB. Gender differences in treatment engagement among a sample of incarcerated substance abusers. *Criminal Justice and Behavior*. 2007; 34(9):1143–1156.
- Walters GD. Developmental trajectories, transitions, and nonlinear dynamical systems: A model of crime deceleration and desistance. *International Journal of Offender Therapy and Comparative Criminology*. 2002; 46(1):30–44. [PubMed: 12112987]
- Wexler HK, Melnick G, Lowe L, Peters J. Three-year reincarceration outcomes for Amity in-prison therapeutic community and aftercare in California. *The Prison Journal*. 1999; 79(3):321–336.
- Yochelson, S.; Samenow, SE. *A profile for change*. Vol. I. New York: Jason Aronson; 1976. The criminal personality.

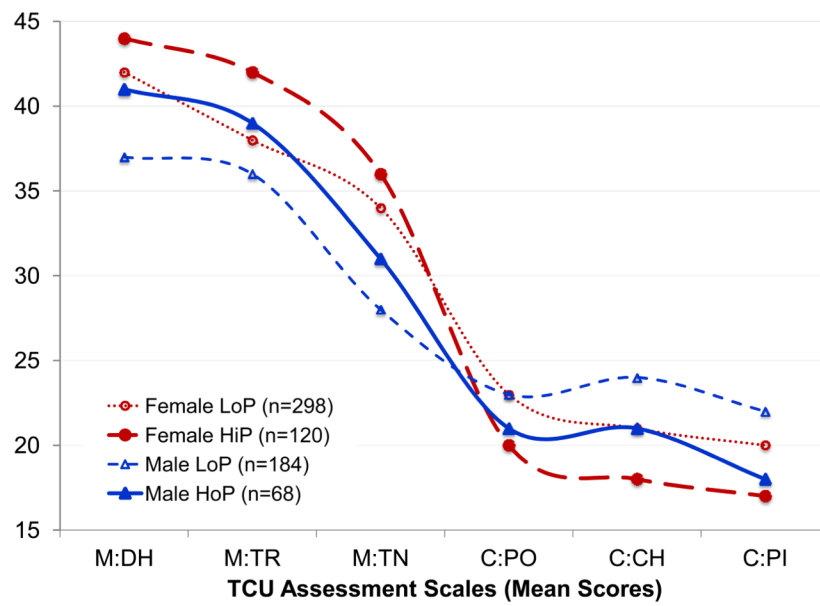


Figure 1. Scale scores for female and male samples of high versus low participating clients.

Table 1
Summary of Means, Distributions, and Psychometric Statistics for TCU Short Form Assessments

Scales	N	Mean	Mean range	S.D.	1 st quartile	2 nd quartile	3 rd quartile	Inter-quartile range	Coefficient Alpha ^d		Alpha N	Alpha Range
									Total	Within		
TCU Drug Screen II (TCUDS)												
TCUDS II	5022	5.2	3.6 – 6.2	2.98	3.0	5.0	8.0	5.0	.87	.86	5133	.84 – .89
Criminal Thinking Scales												
Entitlement (EN)	15096	17.5	16.0 – 19.9	6.00	11.7	18.3	20.0	8.3	.86	.85	14973	.83 – .88
Justification (JU)	15752	19.7	18.4 – 22.0	6.48	15.0	20.0	23.3	8.3	.80	.80	14969	.76 – .82
Power Orientation (PO)	15754	23.2	21.4 – 26.6	7.10	18.6	22.9	27.1	8.6	.83	.82	14952	.79 – .84
Cold Heartedness (CH)	15755	22.3	19.1 – 28.1	6.75	18.0	22.0	26.0	8.0	.67	.65	15021	.61 – .70
Rationalization (RN)	15755	28.1	25.4 – 31.4	8.15	22.0	28.3	33.3	11.3	.80	.78	14963	.74 – .82
Personal Irresponsibility (PI)	15751	20.2	18.1 – 22.9	6.29	16.7	20.0	23.3	6.7	.73	.72	14966	.68 – .75
Motivation Scales												
Problem Recognition (PR)	15876	36.3	32.4 – 41.0	9.13	31.1	37.8	42.2	11.1	.90	.89	15660	.83 – .91
Desire for Help (DH)	15876	40.3	37.2 – 43.9	7.28	36.7	41.7	46.7	10.0	.81	.79	15730	.77 – .82
Treatment Readiness (TR)	15876	36.7	33.8 – 41.3	7.51	32.5	37.5	41.3	8.8	.84	.82	15715	.80 – .84
Treatment Needs (TN)	15876	33.5	29.6 – 38.7	7.76	28.0	34.0	38.0	10.0	.64	.62	15785	.53 – .66
Psychological Functioning Scales												
Self Esteem (SE)	15818	36.8	33.5 – 39.3	7.54	31.7	38.3	41.7	10.0	.76	.75	15724	.67 – .81
Depression (DP)	15818	23.9	19.8 – 28.8	8.17	18.3	23.3	30.0	11.7	.81	.77	15596	.73 – .81
Anxiety (AX)	15818	27.1	22.9 – 33.1	9.04	20.0	25.7	34.3	14.3	.85	.82	15659	.79 – .82
Decision Making (DM)	15818	37.3	35.4 – 38.6	5.70	33.3	37.8	40.0	6.7	.78	.78	15622	.75 – .80
Expectancy (EX)	15818	41.4	38.6 – 42.9	7.70	37.5	42.5	47.5	10.0	.78	.78	15732	.69 – .80
Social Functioning Scales												
Hostility (HS)	15743	24.1	21.8 – 28.8	8.00	18.8	22.5	28.8	10.0	.84	.83	15575	.81 – .85
Risk Taking (RT)	15743	31.1	29.3 – 33.4	7.70	25.7	31.4	37.1	11.4	.80	.80	15597	.74 – .82
Social Support (SS)	15744	42.0	40.1 – 43.7	5.79	38.9	42.2	46.7	7.8	.83	.82	15635	.78 – .85
Social Desirability (SD)	15744	31.2	28.4 – 33.2	5.86	27.3	30.9	34.5	7.3	.75	.73	15609	.67 – .77
SD (dichotomies)	15744	5.3	4.2 – 6.1	2.54	3.0	5.0	7.0	4.0	.68	.66	15615	.65 – .73

Scales	N	Mean	Mean range	S.D.	1 st quartile	2 nd quartile	3 rd quartile	Inter-quartile range	Coefficient Alpha ^a		Alpha N	Alpha Range
									Total	Within		
Engagement Scales												
Treatment Participation (TP)	10631	42.0	40.4 – 44.0	5.21	40.0	41.7	45.8	5.8	.90	.90	10464	.86 – .92
Treatment Satisfaction (TS)	10631	36.0	32.7 – 37.9	7.30	31.4	37.1	40.0	8.6	.81	.81	10518	.75 – .84
Counselor Rapport (CR)	10631	40.0	38.4 – 41.5	6.66	37.5	40.0	44.2	6.7	.94	.94	10475	.93 – .95
Peer Support (PS)	10631	37.3	33.8 – 39.8	7.33	34.0	38.0	40.0	6.0	.82	.81	10536	.77 – .84

^aCoefficient alpha reliabilities are calculated based on total covariance matrix (Total) and within (Within) covariance matrix

Table 2
 ctioning Scales at Time 1 with During-Treatment Engagement

	Time 3 Engagement Scales				Time 4 Engagement Scales			
	Treatment Participation (TP)	Treatment Satisfaction (TS)	Counselor Rapport (CR)	Peer Support (PS)	Treatment Participation (TP)	Treatment Satisfaction (TS)	Counselor Rapport (CR)	Peer Support (PS)
	.11*	.05 ^a	.09*	.10*	.12*	.07 ^a	.10*	.13*
	-.29*	-.10*	-.21*	-.13*	-.28*	-.13*	-.21*	-.17*
	-.21*	-.08 ^a	-.15*	-.06 ^a	-.19*	-.12*	-.15*	-.09*
	-.18*	-.13*	-.16*	-.13*	-.15*	-.15*	-.14*	-.12*
	-.15*	-.07 ^a	-.13*	-.15*	-.19*	-.04	-.11*	-.12*
	-.17*	-.19*	-.16*	-.20*	-.12*	-.22*	-.15*	-.19*
	-.28*	-.13*	-.20*	-.17*	-.24*	-.15*	-.20*	-.18*
	.23*	.13*	.16*	.19*	.21*	.12*	.16*	.21*
	.31*	.17*	.21*	.22*	.28*	.14*	.19*	.23*
	.34*	.29*	.27*	.28*	.31*	.27*	.26*	.28*
	.14*	.08*	.11*	.12*	.19*	.07 ^a	.11*	.16*
	.04	.00	.03	.04 ^a	-.01	.01	.02	-.00
	-.10*	-.10*	-.08*	-.10*	-.01	-.09*	-.04	-.06 ^a
	-.05 ^a	-.08 ^a	-.03	-.08 ^a	.03	-.08 ^a	-.02	-.04
	.15*	.07 ^a	.10*	.08 ^a	.08 ^a	.06 ^a	.08 ^a	.04
	.14*	.07 ^a	.10*	.06 ^a	.11*	.09*	.09*	.02
	-.14*	-.13*	-.12*	-.11*	-.08 ^a	-.14*	-.10*	-.09*
	-.05 ^a	-.10*	-.07 ^a	-.06 ^a	-.04	-.15*	-.09*	-.03

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	Time 3 Engagement Scales				Time 4 Engagement Scales			
	Treatment Participation (TP)	Treatment Satisfaction (TS)	Counselor Rapport (CR)	Peer Support (PS)	Treatment Participation (TP)	Treatment Satisfaction (TS)	Counselor Rapport (CR)	Peer Support (PS)
	.30*	.13*	.22*	.24*	.29*	.13*	.23*	.17*
	.08*	.14*	.10*	.08*	.05 ^a	.16*	.09*	.05 ^a

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