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Do Dimensions of TC Treatment Predict Retention and Outcomes?

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Abstract

First week Dimensions of Change Instrument (DCI) assessments from a cohort of 519 adults entering six TCs were used to predict treatment retention and outcomes. More positive first week response to TC social processes, *Community Responsibility*; *Resident Sharing Support and Enthusiasm*; *Group Process*; and *Clarity and Safety*, and to one TC personal development process, *Positive Self-Attitude and Commitment to Abstinence*, predicted retention for the first month. Improvement at 30 days in *Clarity and Safety* and *Resident Sharing, Support and Enthusiasm* scores predicted retention in treatment for 3, 6 and 9 months. In multivariate analyses available for a subset of the entry cohort, longer tenure in treatment was a robust predictor of post-treatment outcomes. First week DCI scores on the community process scales predicted post-treatment AOD abstinence and functioning.

Keywords

therapeutic community; treatment process; adults; retention; post-treatment outcomes

1. Introduction: TC Treatment Process

Recovering drug dependent people developed the Therapeutic Community (TC) treatment modality as a “mutual-help” or “self-help” endeavor in the 1950s. Early TC proponents believed that drug dependence treatment must address the “whole person” whose lifestyle and “criminal ways of thinking” are at the root of initiation and maintenance of drug use. They believed that changing antisocial thinking and exploitative social interaction could be best done by immersion in a “total community” with a therapeutically oriented social environment single-mindedly focused on producing therapeutic change in the whole person. In such a therapeutic community every aspect of deviant behavior and thinking would be exposed and subject to correction by other recovering persons who would recognize the distorted ways of thinking and social interaction that are common in drug addiction.

Between 1960 and 1990, TC treatment programs spread in both the United States and other countries, and by 2002 a large proportion of the over 150,000 annual admissions to long-term residential treatment programs in the United States were to TCs (National Institute on Drug Abuse, 2002). In the US, national retrospective and prospective studies were carried out to study the effectiveness of drug abuse treatment which included this very popular modality. The Drug Abuse Reporting Program (DARP), summarized by Simpson & Sells (1982), served as a model for later evaluations of effectiveness of treatment for drug abuse,

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including the Treatment Outcomes Prospective Study (TOPS; Hubbard et al, 1989; Joe, Simpson, & Hubbard, 1991) and the Drug Abuse Treatment Outcomes Studies (DATOS)

Of particular relevance to the present study are findings from DATOS on the effects of length of stay in treatment (Hubbard, Craddock, & Anderson, 2003). Specifically, The DATOS studies found that reductions in illegal activity and increases in full-time employment were related to length of stay in long-term residential treatment with stays of 6 months or longer being more effective. These and similar findings from earlier studies have led to the conceptualization of tenure in treatment as an important mediator of positive effects of treatment. With respect to TC treatment, results from DATOS found that substantial numbers of individuals treated in TC programs remained abstinent after treatment and lived lives in which they engaged in much less criminal behavior. The combined DATOS results from the 1-year and 5-year post-treatment follow up also provide some evidence for the stability of outcomes for individuals receiving TC treatment (Gerstein & Harwood, 1990), demonstrating that TC treatment was as effective in producing post treatment benefits as methadone maintenance treatment for heroin addicts and was more effective than any other form of treatment for individuals using cocaine and other drugs.

In response to the findings of these major studies, treatment funding agencies urged the research community to study the components of treatment that make them effective and that might lead to improving treatment programs making them more cost-effective. This has been a particularly daunting undertaking for the TC modality. Attempts to deconstruct the flowing TC treatment process during the 1990s have used structural aspects of the treatment process as captured in client contact records, volume of types of services received, video and audio recordings of client-group interactions, and therapist/counselor interpretations of treatment process as experienced by clients (Messina, Nemes, Wish, & Wraight, 2001). However, although Simpson and colleagues (Simpson, Joe, Greener, & Rowan-Szal, 2000) emphasized quantifying the components of treatment responsible for producing better client outcomes, they also pointed out that counseling session attributes and therapeutic involvement are only a small portion of the treatment in the therapeutic community model of treatment (Joe et al., 1999). Similarly, TC treatment providers believe that these variables do not capture the important components of TC process that account for the observed positive post TC treatment outcomes. This made urgent the development of methods to capture the effective dimensions of the TC "community-as-treatment" process.

A measurement approach to this challenge had emerged from the pioneering studies of Rudolph Moos and colleagues (Moos, 1974; 1988; Moos, King & Patterson, 1996) that demonstrated that the quantified social environment dimensions of psychiatric wards were statistically related to patient treatment outcomes. Leda (1993) successfully applied this dimensional scaling approach to psychiatric treatment facilities that use a TC environment approach, demonstrating that social environment dimensions of psychiatric TC wards were statistically related to treatment outcomes.

Following these examples, Phoenix House Foundation, one of the larger TC organizations in the US, initiated a partnership with the RAND Corporation to study the outcomes of a recent standardization of the TC "community-as-treatment" method provided in its 85 programs. The first efforts were devoted to identifying and operationalizing the discrete elements of "community-as- treatment" process, as described by DeLeon (1994) that might be critical to effectiveness. The TC treatment environment was conceptualized as comprising two core domains of effective agency: a shared community environment operating through large-group interactions that promote pro-social values (crime and drug-free lifestyle, and mutually acceptable interpersonal interactions) and a *personal development* community environment consisting of informal interpersonal interactions that promote cognitive

rehearsal of skills useful in managing impulsive behavior and emotional dysregulation. These two core domains were operationalized with the client report Dimensions of Change Instrument (DCI; Wenzel, 2001; Wenzel et al, 2004), whose eight factors are conceptualized as representing either the community environment or personal development environment.

The DCI is the most widely administered and studied instrument for measuring TC treatment process. Another approach to measuring TC treatment process was developed by Kressel and colleagues, who demonstrated their measures' sensitivity to variations in time in treatment among a cross-sectional sample of 346 adult clients in two residential TC facilities (Kressel, De Leon, Palij, & Rubin, 2000). The DCI has been examined cross-sectionally in male and female prison populations (Chan et al, 2004), its development and psychometric properties have been described in detail, and its factor structure has been established among adult and adolescent TC clients (Orlando et al., 2006). Furthermore, Paddock et al, (2006) demonstrated that the DCI factors are sensitive to change during the course of treatment among adults, and a study of the association of DCI ratings with treatment retention and post treatment outcomes among adolescents (Edelen et al, 2007) showed promising results. In that study, although increases in DCI scores during the first 30 days of treatment were not directly predictive of post treatment outcomes, adolescents who increased their ratings during the first 30 days in treatment on three factors associated with personal development were more likely to stay in treatment for 90 days or more; and remaining in treatment for 90 days or more increased the likelihood that adolescents would attend 12-step meetings and have a 12-step sponsor after leaving treatment.

2. Study Goals

The general aim of the present study was to extend our knowledge of the TC treatment by examining the utility of the DCI component dimensions for their relationship with early and longer-term retention and posttreatment outcomes among an entry cohort of adult TC clients. More specifically, the first aim of this study was to examine whether very early responses to the DCI are predictive of staying in treatment for at least 30 days. The second aim was to examine whether improvements in DCI scores during the first 30 days would be positively associated with longer periods of tenure in treatment (3, 6 and 9 months). The third aim was to confirm that more periods of tenure in treatment are associated with positive functioning in the community post-treatment. The final aim of the study was to determine whether first week DCI component scores or improvements in these scores during the first 30 days add to the prediction of post treatment functioning after considering tenure in treatment.

Simpson and his colleagues (Simpson et al., 1995, 1997; Joe et al., 1998) in their drug abuse treatment process model describe the first month of treatment as an engagement stage that initiates the recovery stage. The engagement stage has been studied using patient self-reports of indicators of therapeutic involvement such as commitment to treatment, relationship rapport with a primary counselor and confidence in treatment (Joe et al., 1998; Knight et al., 2000). However the amounts of explained variance in retention in treatment were low for all modalities of treatment (Joe et al., 1999). Our analyses of the relationship between DCI scores and retention and outcomes among adolescents (Edelen et al, 2007) suggested that scores in the personal development domain play an important role in retention and positive outcomes. Therefore, we expected scores in this domain to emerge as significant predictors of retention and outcomes among adults. Although there were no studies in the literature that related the community dimensions of TC treatment to retention or post treatment outcomes, we hypothesized that the DCI scales describing the TC community process would be positively associated with early and longer-term retention and treatment outcomes.

3. Methods

3.1 Participants

Analyses are based on a cohort of 519 adult substance abuse clients who entered one of six participating Phoenix House residential sites in New York, New England, California, and Florida during the 9 month period from October 2002 to June 2003 and enrolled in a study of quality of care in therapeutic communities. The selected participating programs were chosen to be representative of the larger population of Phoenix House adult residential programs with respect to location, size, and types of clients served. The program locations included four urban and two rural settings, and ranged in capacity from 20 to 145 clients (mode= 45), with client-to-counselor ratios between 5.1 and 13.5. Both RAND and Phoenix House Institutional Review Boards approved the survey administration protocol. All participants gave written consent. Trained Phoenix House staff facilitated computer self-administered in-treatment DCI assessments, and trained data collectors interviewed participants primarily via telephone to obtain post-treatment follow-up data.

The sample of 519 clients completing the initial assessment represents 75% of eligible adults. Eligible adults were not enrolled either because of DCI administration scheduling conflicts (15%) or client refusal to participate (10%). Data from the full entry cohort (N=519) were used to address the first study goal: determine whether clients' early DCI self-reports predict retention in treatment for the first 30 days. Of the entry cohort of 519 clients, 454 individuals (87%) were in treatment for more than 28 days. Data from these 454 individuals were used to examine the study's second aim: to provide evidence for the ability of DCI scores and changes in them during the first 30 days of treatment to predict client retention in treatment for 3, 6 and 9 months.

Of the entry cohort, 227 individuals were eligible to complete a post-treatment follow-up survey, having been in the TC for at least 30 days and having completed at least 2 in-treatment assessments, and 78% (n= 177) did so. While these rates of missing data are substantial, they are typical of those seen in longitudinal substance abuse treatment studies (Baekeland and Lundwall, 1975; Primm et al., 2000; Yang and Shoptaw, 2005). Data from these 177 individuals were used to address the third and fourth study aims: to examine whether length of stay in treatment is related to positive functioning in the community post-treatment; and to determine whether first-week DCI scores and 30 day DCI scores add to the prediction of positive functioning in the community beyond length of retention in treatment.

Table 1 displays the demographic and pre-treatment characteristics of the entire study sample and according to participation in the follow-up survey. The majority of participants in the full sample were male (79%), white (60%), under age 35 (62%), not married (86%), with at least a high school education (66%). Just over half the sample was referred through the criminal justice system (other referral sources included self, family, primary care physician, employer), cocaine was the most frequently cited primary drug (44%). The majority of participants had been in drug treatment previous to this admission (70%), and a small percentage (12%) was expelled from prior treatment. Just over half the sample had been arrested in the year prior to treatment, a small minority was taking medication for a psychiatric problem at intake (12%), and nearly half the sample had at least one substance-abusing parent (46%). The follow up sample was less likely to have been referred by the criminal justice system ($\chi^2_{(1,519)}=14.13, p<.01$), was less likely to have an arrest history ($\chi^2_{(1,519)}=13.06, p<.01$), and was more likely to have been taking medications for a psychiatric problem at treatment entry ($\chi^2_{(1,519)}=5.03, p<.05$). Additionally, the follow-up sample was less likely to have either a very short (<90 days) or very long (>12 months) length of stay in treatment ($\chi^2_{(4,519)}=70.05, p<.01$).

3.2 Measures

3.2.1 Intake Measures—Phoenix House collects demographic and selected personal information as a regular part of the admission process (i.e., variables listed in Table 1). Clients provided written permission for the study team to access this information, and these variables were included as covariates in all regression models.

3.2.2 Measure of TC Treatment Processes—The DCI is a client report instrument intended to capture perceptions of TC treatment process dimensions. The DCI asks respondents to consider 54 statements reflecting perceptions of various components of the TC treatment process, and indicate their extent of agreement on a 5- point scale (1 = *Not at all* to 5 = *Completely*) such that higher scores indicate a greater extent of agreement. All items are worded in the positive form. The present study uses the 8 dimensions developed from factor analyses which are reported in detail in Orlando et al. (2006). Four of these factors are conceptualized as in the **community process domain** (*Community Responsibility* – the client personally accepts this standard of behavior; *Clarity and Safety* – the client accepts the TC’s goals, structure, patterns of interpersonal interaction and orderliness and feels safe in the treatment community environment; *Resident Sharing, Support, and Enthusiasm* – the client perceives residents as being enthusiastically engaged in sharing of personal feelings and being supportive in social interactions; and *Group Process* – the client perceives that residents actively participate in group therapy activities) and four are in the **personal development domain** (*Introspection and Self-Management* – the client engages in personal self-awareness and reflection, and adopts self-management enhancement activities; *Positive Self-Attitude and Commitment to Abstinence* – the client verbalizes feelings of self-efficacy and commitment to achieving abstinence; *Problem Recognition* – the client recognizes that his/her personal behavior and attitudes are a cause of personal and interpersonal problems; *Social Network* – the client maintains and interacts with a supportive social network outside of the TC community).

Trained research staff administered the computerized DCI at day 5 after treatment admission with a window from Day 2 to Day 10, and at day 30 of treatment with a window from Day 28 to Day 44. Table 2 shows the descriptive information for the 8 DCI dimensions across the two administrations. At both measurement points the alphas reach acceptable levels. All mean scores improve between the initial and 30 day assessments. It is worth noting that both the *Commitment to Abstinence* and the *Community Responsibility* mean scores are above four on a five-point scale.

3.2.3 Tenure in Treatment: Measures of Treatment Initial and Longer-Term Retention—The Phoenix House computerized data system provided the length of stay in days for each client. The definition of tenure in treatment was operationalized with dichotomous indicators of staying in treatment. Clients were categorized in terms of whether they attained several threshold points of tenure in treatment (“dose”), using 4 0/1 indicators to reflect receiving at least 30 days, 3 months, 6 months, and 9 months of treatment. Additionally, retention was represented as a single ordinal variable ranging from 0 to 4 (0 = *<90 days* to 4 = *12 months or more*) when used as an independent variable in predicting post-treatment functioning.

3.2.4 Measures of Post-Treatment Functioning—The post-treatment survey, administered by telephone approximately three months after clients left treatment, asked respondents to report on their activities in the past 30 days. This brief survey was approximately 10 minutes in length. Clients responded to questions about the number of days in the past 30 that they used alcohol, marijuana, cocaine or crack, stimulants, heroin, inhalants, hallucinogens, psychedelics, tranquilizers, sedatives (Burnam et al., 1995;

Fishburne et al., 1980). From these items a variable was derived to indicate whether a respondent had used any substance on any day in the past 30 days. The interviewer included two questions about whether any of the people that clients had been socializing with in the past 30 days drank weekly or used drugs, and whether they attended any 12-step meetings and had a 12-step sponsor (Burnam et al., 1995). The clients also responded to questions about whether they were working at a full or part time job.

3.3 Missing Data

The data set includes complete admissions data for demographic and personal characteristics, and retention information for all 519 participants. There is also complete post-treatment functioning data for the follow-up sample of 177. The amount of missing data for the baseline DCI sample was negligible (<1%), but was problematic for the 30-day assessment. Of the 454 who stayed in treatment for at least 28 days, only 390 completed the 30-day assessment. The majority ($n=62$) of the 64 (14%) non-responders did not complete the 30-day assessment because the data collectors were unable to schedule assessments within the allowable 2 week window; the remaining two clients refused to participate. These 64 individuals did not differ significantly from those who completed the 30-day assessment on any demographic or personal characteristics. However, these missed clients were more likely to be from one of the six treatment sites ($\chi^2_{(5, 454)}=23.36, p<.01$) and tended to have shorter total lengths of stay ($\chi^2_{(4, 454)}=10.72, p<.05$). Using SAS version 9.1 (SAS, 1990), we generated 50 imputed values for the 64 missing observations with SAS PROC MI and used PROC MIANALYZE to synthesize results from the regression analyses obtained from each multiply imputed data set (Little & Rubin, 2002; SAS Institute, 1990) to enable generalization of results to the sample that remained in treatment for 28 days or more.

3.4 Analytic Approach

The analysis comprised estimation of a series of multilevel logistic regression models using SAS PROC GLIMMIX (SAS Institute, 1990), which allows for the inclusion of a random effect for treatment site and generates model standard errors that account for the clustering of participants in 6 treatment sites. The dependent variables included indicators for the four tenure in treatment periods (first 30 days, 3, 6, and 9 months) and five post-treatment functioning variables. The first set of eight models (study aim 1) examined treatment remaining in treatment for the first 30 days for the entire entry cohort as a function of each of the 8 first week DCI scores controlling for demographic and personal factors listed in Table 1, and included a random effect for the clustering of clients within treatment sites. The next set of models (study aim 2) examined whether first week and changes from first week in each of the 8 DCI scores at 30 days of treatment predicted achieving each of the subsequent treatment lengths of stay (3, 6, and 9 months). Separate models were specified for each period of stay/ DCI score combination; model predictors were similar to those used in the first set of models with the addition of each 30-day DCI score to the predictor set. A third set of analyses (study aim 3) modeled each follow-up post-treatment outcome as a function of the ordinal period of stay variable. As in the previous analyses, the same set of covariates was used, including a random effect for treatment site. A final series of models (study aim 4) was estimated by adding each of the 8 DCI first week and 30-day scores to these basic outcome models to determine whether first week DCI scores or changes in these scores during the first 30 days of treatment added to the prediction of positive post-treatment functioning.

4. Results

4.1 Study Aim 1: Background and First Week DCI Scores as Predictors of 30 day retention threshold)

Among the available background variables listed in Table 1, only referral source was a significant predictor of first 30 day treatment retention in the multilevel logistic regression models. Specifically, relative to clients referred from other sources, adults referred by the criminal justice system were more likely to remain in treatment for at least 30 days (OR (95% CI) = 2.22 (1.17–4.20), $p < .05$). Table 3 displays the model-based odds ratios reflecting the associations between the eight DCI scale scores and first 30 day retention. After controlling for all pre-treatment characteristics, higher first week scale scores for five of the eight DCI dimensions (examined sequentially) were significantly associated with first 30 day retention.

4.2 Study Aim 2: Background and DCI Process (first week and 30-day) Predictors of 3, 6, and 9-month tenures in treatment

Clients referred by the criminal justice system were more likely than those referred by other sources to remain in treatment for each length of tenure threshold: 3 months OR (95% CI) = 2.42 (1.53–3.84), $p < .01$; 6 months OR (95% CI) = 2.09 (1.37–3.20), $p < .01$; and 9 months OR (95% CI) = 1.70 (1.08–2.68), $p < .05$. Adult clients who had not completed high school were significantly less likely than those with a high school or greater education to stay in treatment for 9 months or more (OR (95% CI) = 1.75 (1.14–2.68), $p < .05$).

After controlling for background characteristics none of the first week DCI process scores was associated with longer periods of tenure in treatment. However, higher scores at 30 days on two of the DCI scores in the treatment community process domain were significantly associated with longer treatment tenure thresholds: *Clarity and Safety* 3 months OR (95% CI) = 1.74 (1.05–2.89), 6 months OR (95% CI) = 1.62 (1.08–2.45), 9 months OR (95% CI) = 1.82 (1.22–2.73); and *Resident Sharing Support and Enthusiasm* 6 months OR (95% CI) = 1.74 (1.11–2.73), 9 months OR (95% CI) = 1.71 (1.11–2.64).

4.3 Study Aims 3 and 4: Background, Treatment Retention and DCI Process Predictors of Post Treatment Outcomes

None of the client background variables was a significant predictor of post-treatment functioning. The 5-level tenure in treatment variable was significantly associated with four of the five post-treatment functioning outcomes. Relative to those who stayed in treatment for shorter periods, adults who stayed in treatment longer were more likely to report abstinence from AOD use, (OR (95% CI) = 1.50 (1.01–2.23), $p < .05$), attendance at 12-step meetings (OR (95% CI) = 1.71 (1.20–2.45), $p < .05$), having a 12-step sponsor (OR (95% CI) = 1.59 (1.15–2.20), $p < .05$), and working at a full or part time job (OR (95% CI) = 1.81 (1.29–2.54), $p < .05$). Staying in treatment for more threshold periods was not associated with reduction of self exposure to substance using peers after treatment.

Table 4 displays the associations of the four DCI community process first week and 30-day scores that demonstrated significant relationships with post-treatment AOD abstinence. Higher scores on *Community Responsibility*, *Clarity and Safety*, *Group Process*, and *Resident Sharing Support and Enthusiasm* during the first week were associated with a greater likelihood of AOD abstinence. Paradoxically positive change in the *Clarity and Safety* score during the first 30 days was significantly associated with less post treatment AOD abstinence.

There were also significant relationships between individual DCI process scores and the other four post treatment functioning variables. Clients with higher first week scores on *Resident Sharing Support and Enthusiasm* were more likely to report not exposing themselves to substance using peers after treatment (OR (95% CI) = 3.73 (1.53–9.10)). Clients with higher first week *Group Process* scores were more likely to report having a 12-step sponsor (OR (95% CI) = 2.38 (1.19–4.77)), and clients who improved in *Positive Self-Attitude and Commitment to Abstinence* during the first 30-days were more likely to attend 12-step meetings (OR (95% CI) = 2.67 (1.07–6.66)).

5. Discussion

Despite the absence of a higher order factor structure corresponding to the community process and personal development domains represented by the DCI, the pattern of results in this study provides strong support for the conceptual and clinical distinctions between community processes and personal development processes in TC treatment. Specifically, results from this study indicate that client early responses and changes in these responses to scales in the community process domain have an effect on the first 30 day and longer-term retention and post treatment functioning, whereas scales in the personal development domain appear less important for predicting these outcomes. First week responses to each of the four scales in the community process domain were associated with remaining in treatment for 30 days and remaining abstinent from AOD use after leaving treatment. Improvement in the *Resident Sharing, Support, and Enthusiasm* dimension at 30 days also had a positive effect on the six and nine month periods of tenure in treatment. Improvement in *Clarity and Safety* predicted in addition, more tenure in treatment for each of the three, six and nine month periods. In contrast, only one score in the personal development domain, *Commitment to Abstinence*, predicted first 30 day retention, and none of the personal development domain improvement scores were associated with longer treatment tenure.

We conceptualized treatment process as being reflected by *change* in DCI scores during treatment and it is this change that we most strongly hypothesized to be related to retention and outcomes (as in adolescents; Edelen et al, 2007). Given our significant findings for first week DCI scores in predicting first 30 day retention and post-treatment AOD abstinence, it is instructive to consider these results in light of the partial overlap between the content of the DCI scales and established measures of treatment motivation and readiness that have been identified as predicting treatment first 30 days and longer retention, and post-treatment outcomes in the TC (Joe, Simpson, and Broome, 1999; Joe GW, Simpson DD, Dansereau DF, Rowan-Szal GA., 2001; Simpson, Joe, Rowan-Szal, and Greener 1997), including Therapeutic Involvement (Joe et al., 1999), Motivation for Treatment (Joe et al. 1998), acknowledging having problems that are drug-related (Broome et al, 1997), and readiness to enter a process to guide change (Simpson and Joe, 1993). The robust relationship of five of the eight first week DCI scores with first 30 day retention in treatment and post-treatment abstinence suggest that perhaps early assessment with the DCI, especially scales in the community process domain, serves somewhat as a proxy for motivation for treatment among adults in the TC setting.

Whether it is a proxy for motivation or not, these findings suggest that program efforts to improve treatment processes in the community domain may be useful in increasing early retention and tenure in treatment. This is congruent with the view that the effective agency of TC treatment is the community environment or "community-as-treatment" as it is called by TC program leaders. During longer periods of tenure in treatment supportive peers have more opportunities to provide reminders of recovery goals and peer positive reinforcement for changes in behavior. The medium through which the reinforcement is provided is peer sharing of encouragement about the possibility of recovery and their increased social

bonding as they provide mutual support during the emotional ups and downs during the personal development process. Longer periods of tenure in the TC provide more occasions for reinforcement of community-approved client attitudes and behaviors.

The *Clarity and Safety* dimension includes items relating to two important sub-themes amenable to TC treatment program management. Traditional TCs are managed by residents who are further along in their recovery and have been promoted in the community hierarchy. These community leaders have shown by their performance in house maintenance work, administrative and therapeutic activity roles that they can be considered role models for newer clients. The TC hierarchical authority structure models and reinforces adaptation to the work and treatment values of the community that is the core of the "community-as-treatment" process. When new residents achieve clarity about the goals and processes of the TC hierarchical "community-as-treatment" structure it becomes less stressful to accept and change their behavior to meet community standards. Clients who develop feelings of safety early in their stay have recognized that other TC members are committed to maintaining orderliness, community boundaries and safety through reinforcing community rules. Feeling safe supports participation in therapeutic activities that involve self revelation. Feeling unsafe encourages leaving treatment early.

Improvement at 30 days in the *Clarity and Safety* score was associated with less post treatment abstinence. One possible explanation for this paradoxical finding is that larger improvement scores on this dimension, after taking into account length of tenure in treatment, identify clients who had greater initial difficulty in comprehending the TC treatment process and feeling safe in a community setting. At the beginning of treatment the majority of clients rate the TC as providing a high level of *Clarity and Safety*. Such clients do not have much room to improve their scores, whereas clients who gave poorer ratings to *Clarity and Safety* have more opportunity to increase their rating at the 30-day measurement. Thus, greater improvement in ratings of *Clarity and Safety* may identify initially low-scoring clients who manage to stay in treatment beyond 30 days and who find themselves in a more personally challenging psychological situation. The improved ratings may indicate greater difficulty in comprehending the TC environment reflecting challenged cognitive abilities, social competence and developmental experiences. These clients' limitations may account for poorer post treatment outcomes.

The content of the *Resident Sharing, Support and Enthusiasm* dimension describes how residents participate in the "community-as-treatment" environment. Expressions of enthusiasm about the treatment processes, along with supportive sharing of personal feelings promote remaining in treatment. TC clinicians identify *Clarity and Safety* and *Resident Sharing, Support and Enthusiasm*, as central to reducing distorted thinking and destructive interpersonal interaction patterns that are integral to the drug using criminal lifestyle. *Clarity and Safety* and *Resident Sharing, Support and Enthusiasm* also have an important indirect effect through supporting clients' remaining in treatment for more threshold periods.

The results of this study are quite different from those of similar analyses conducted with adolescents (Edelen et al, 2007). Among an entry cohort of adolescents in residential TC treatment, first week DCI scores were not predictive of retention or outcomes, but improvements in the first 30 days on three DCI scores in the personal development were associated with longer retention. The fact that the process scores demonstrate such differential predictive power in adolescents and adults implies that the treatment process itself is quite distinct for these two groups. Although this is not inconsistent with current thinking about adolescent and adult substance abuse treatment (e.g., Winters 1999), the differences warrant further consideration in future efforts to characterize TC treatment process.

The study has limitations that should be taken into account when interpreting the findings. The study selected samples from a limited number of facilities that may not be representative of all people in TC treatment either in Phoenix House or other facilities. This may limit generalizability of findings. In addition, the post treatment outcome findings may be affected by biases resulting from a lack of representativeness in the follow-up sample. The follow-up sample included fewer individuals who volunteered for treatment. In addition, this sample was more likely to be taking psychotropic medications at treatment intake, suggesting that they were more likely to have a co-occurring disorder. Finally, the results of this study are based on several multivariate analyses. Although most of the significant results had statistics with associated p-values $<.0001$, it is possible in light of the many analyses conducted, that some of the significant results occurred by chance.

Studies of the ability of the DCI to predict retention and outcomes in other facilities would help determine the generalizability of these findings. Follow up studies for longer periods would increase understanding of the relationship between DCI-measured processes and durability of recovery. Studies examining experimental modifications of therapeutic community treatment processes might use the DCI to measure how they impact the “dimensions of change” that influence client remaining in treatment for the first 30 days, retention for longer periods of tenure, and post treatment outcomes.

The DCI scales also have the potential for development as a measure assessing client adjustment to residential treatment. Such research would make it possible to identify individuals who are having difficulty in adapting to the TC for example having difficulty in comprehending and feeling safe in the TC environment. Other residents could be encouraged to increase their sharing, enthusiasm and support to help these individuals accommodate to TC treatment process.

6. Conclusion

This study brings into focus the importance of community dimensions of adult residential TC treatment processes on first 30 day and longer-term retention and post treatment abstinence. The findings of this study confirm the need for research that includes information about the community environment dimensions of treatment along with measures of treatment services and measures of client therapeutic involvement in order to build a more complete model of how these variables interact to produce abstinence and positive functioning.

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Table 1

Demographic and Pre-treatment Characteristics for the Full Sample and According to Participation in Follow-up Survey in Percent

		In Follow-up Sample		
		Total	No	Yes
Pre-treatment characteristic		(N=519)	(n = 342)	(n = 177)
Gender	Male	78.6	80.1	75.7
	Female	21.4	19.9	24.3
Ethnicity	White	60.3	59.7	61.6
	Black	22.5	23.7	20.3
	Hispanic	7.9	6.7	10.2
	Other	9.3	9.9	7.9
Age	21–35	61.9	62.9	59.9
	36–45	32.0	31.6	32.8
	46 and over	6.2	5.6	7.3
Married		13.9	13.5	14.7
Education: HS or more		66.1	64.0	70.1
Criminal Justice Referral *		54.9	60.8	43.5
Primary drug	Cocaine	44.0	45.0	41.3
	Heroin/ Other	26.4	27.2	24.9
	Alcohol	16.7	15.2	20.3
	Marijuana	7.1	7.0	7.3
	Amphetamines	5.8	5.6	6.2
Prior drug treatment		70.1	69.6	71.2
Prior treatment expulsion		12.1	11.7	13.0
Arrested in year prior to this treatment *		53.4	59.1	42.4
Taking psychiatric medication		12.0	9.7	16.4
Child of substance abuser		45.9	45.6	46.3
Days in treatment during this episode *	0–89	31.4	36.6	21.5
	90–179	17.2	14.3	22.6
	180–269	13.9	10.8	19.8
	270–364	12.3	6.1	24.3
	365+	25.2	32.2	11.9

* Note. indicates significant differences according to membership in follow-up sample. Chi-square statistics are reported in text.

Table 2

DCI Factor Means and Alphas at the 5 and 30-day Assessments

Factor	Baseline (N=519)				30-day (n=390)			
	# items	Mean (SD)	alpha		Mean (SD)	alpha		
Community Responsibility	4	4.43 (0.59)	0.68		4.45 (0.56)			0.70
Clarity and Safety	6	3.89 (0.77)	0.83		3.89 (0.74)			0.83
Group Process	6	3.76 (0.66)	0.77		3.82 (0.68)			0.80
Resident Sharing, Support, and Enthusiasm	8	3.65 (0.60)	0.79		3.59 (0.67)			0.85
Introspection and Self-management	7	3.71 (0.72)	0.81		3.92 (0.62)			0.80
Positive Self-attitude and Commitment to Abstinence	9	4.16 (0.68)	0.86		4.27 (0.57)			0.83
Problem Recognition	5	3.98 (0.86)	0.83		4.05 (0.83)			0.81
Social Network	3	3.93 (0.96)	0.75		4.02 (0.91)			0.80

Table 3

First Week DCI Scores Associations with Remaining in Treatment for the First 30 day and Longer Periods of Retention Based on Multilevel Logistic Regression Analyses

Factor	OR (95% CI)
Community Responsibility	1.93 (1.22–3.05)
Clarity and Safety	1.72 (1.19–2.48)
Group Process	2.06 (1.34–3.16)
Resident Sharing, Support and Enthusiasm	2.12 (1.32–3.41)
Introspection and Self-Management	1.29 (0.86–1.91)
Positive Self-Attitude and Commitment to Abstinence	1.84 (1.23–2.74)
Problem Recognition	1.32 (0.98–1.76)
Social Network	1.13 (0.84–1.50)

Note. Entries in bold are significant at $p < .05$. Odds ratios are from eight distinct models (one for each DCI factor). All models included pre-treatment characteristics and controlled for nesting of subjects within treatment sites.

Table 4

Associations of first week and 30-day DCI Scores with AOD Abstinence at the Post-Treatment Follow-up Survey, Based on Multilevel Logistic Regression Analyses

Factor	OR (95% CI)
Community Responsibility – Baseline	2.61 (1.04–6.57)
Community Responsibility – 30-day	0.49 (0.18–1.33)
Clarity and Safety – Baseline	2.37 (1.10–5.10)
Clarity and Safety – 30-day	0.42 (0.19–0.96)
Group Process – Baseline	2.26 (1.11–4.58)
Group Process – 30-day	0.70 (0.35–1.41)
Resident Sharing, Support and Enthusiasm – Baseline	5.63 (1.86–17.02)
Resident Sharing, Support and Enthusiasm – 30-day	0.56 (0.23–1.33)

Note. Entries in bold are significant at $p < .05$. Baseline and 30-day scores on the other 4 DCI scales did not predict post-treatment variables. Because baseline DCI scores were included in the models, Odds Ratios associated with the 30-day scores reflect the effect of changes in DCI. Odds ratios are from four distinct models (one for each DCI factor listed). In addition to baseline and 30-day DCI scores, all models included pre-treatment characteristics and controlled for nesting of subjects within treatment site.