

NEEDS

**MEASURING READINESS FOR CHANGE
AMONG CRACK COCAINE USERS:
A DESCRIPTIVE ANALYSIS**

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ABSTRACT

This study examines the utility of the University of Rhode Island Change Assessment Scale (URICA) in assessing stages of change status with a group of 235 crack/cocaine users who had received treatment for their drug use. Cluster analyses were performed and three subgroups representing differing levels of readiness to change were identified. The three clusters demonstrated no significant differences on most demographic characteristics and other areas of functioning assessed by the Addiction Severity Index (ASI). The three clusters also showed similar improvements between the intake and six-month follow-up in these ASI life domains. The implications of these findings are discussed. [Translations are provided in the International Abstracts Section of this issue.]

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INTRODUCTION

"*Readiness for change*" is a concept that has been linked with successful drug user treatment (1,2,3). Motivated clients are more likely to be clinically engaged, therapeutically compliant and to remain in treatment longer (1,4,5), although other researchers have suggested that persons coerced and held in treatment do as well as those who voluntarily present to treatment (6,7). Nevertheless, even with those coerced into treatment, it would not be unreasonable to assume that there would be a range of motivation and readiness for treatment and that this could effect outcomes among this group. Treatment professionals, researchers, and policy makers alike are eager to find a way to operationalize and measure the readiness for change construct.

Prochaska, DiClemente and their colleagues developed, in work with cigarette smokers, the Transtheoretical Model of Change, which posits that individuals "spiral" through four stages of change relative to a given behavior that they, or others, believe should be altered (8,9,10). These stages—*pre-contemplation, contemplation, action, maintenance*—have been examined in the context of a wide variety of problematic health behaviors, including tobacco use, high-risk sexual practices, anxiety disorders, obesity, sedentary lifestyle, psychological distress, and alcohol use (8,9,11,12). One of the studies was based on 155 adult outpatient psychotherapy patients in which factor analyses were used to identify 32 change-specific items that eventually became the University of Rhode Island Change Assessment Scale (URICA) (13). The items were organized into four scales, or stages, of eight items each. The scales reflected the larger model and were labeled pre-contemplation, contemplation, action, and maintenance. This work not only established the early view that the URICA items represented four stages of change, but also suggested the presence of nine distinct clusters of psychotherapy patients. Other multi-item scales such as the alcohol-specific Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) (14) and Readiness to Change Questionnaire (15) have furthered discussions about the readiness for change concept.

Only recently have published works examined the stages of change with substance users (16,17,18,19). The factor structure of the URICA was examined as administered to a sample of 404 polysubstance users who were admitted to a veterans affairs medical center substance use treatment program (19). The sample consisted of primary alcohol users (52%),

primary cocaine users (15%), and primary opiate users (9%) as the largest groups. The basic four-factor structure of the URICA was supported, although one item from each factor was deleted because of weak loadings. Interestingly, the remaining 28 items and their loadings on the four factors were almost identical to that found in a study of 224 adult alcoholics (8). Standardized subscale scores were subjected to a cluster analysis that resulted in four clusters. Again, these clusters closely mirrored the clusters found in the earlier study with adult alcoholics. No significant differences were found between the clusters on primary addiction (alcohol or drug), previous substance use or psychiatric treatment, employment or marital status, or race.

Other studies with drug use populations have not confirmed the URICA-derived stages of change model (16,20,21). In one of these, a sample of 276 methadone maintenance patients completed the URICA, which was then analyzed for its comparability to previous findings. The results failed to confirm the four-stage model frequently noted in earlier studies of both substance users and other populations. The structure that resulted consisted of 12 items corresponding to precontemplation, contemplation and action stages.

This study uses the URICA and then cluster analytic procedures to identify and describe subgroups representing differing levels of readiness to change among a population of 235 in-treatment (primarily) cocaine and crack cocaine users. Demographic characteristics, participation in treatment and post-treatment functioning in seven life areas, as assessed by the Addiction Severity Index, will be compared across the identified clusters. Findings will be discussed relative to the utility of the URICA in assessing change status by cocaine users as they initiated and completed their drug use treatment.

METHODS

Project Background and Subjects

This study was conducted as a part of a National Institute on Drug Abuse supported project, designed to examine the effectiveness of strengths-based case management as an enhancement to treatment outcomes (22). It was conducted at the Department of Veterans Affairs Medical Center in Dayton, Ohio. Veterans who applied for four week long residential treatment offered at the medical center's substance use treatment program between April 1996 and July 1999 were recruited as subjects. Eligibility for participation was based on: any use of cocaine or opiates

in the six months preceding treatment, or a regular pattern of use of any other drugs (excluding alcohol) for three consecutive weeks, and no formal drug treatment in the three months prior to entry into this treatment episode.

A total of 235 subjects completed the intake, discharge and six-month follow-up interviews and were included in this study. The majority of the 235 subjects were male (98.3%), with a mean age of 42 years. Approximately 68% of the subjects were African-American, and more than 90% had completed high school or a GED. Only 11% of the subjects were married or living as married, and less than a quarter (21.3%) had a steady job at the time of admission to the project. About 33% reported that they were currently on probation or parole or awaiting charge, trial or sentence. More than half of the subjects (53.2%) reported that cocaine or crack cocaine was their most problematic substance; another 32% reported cocaine or crack cocaine as their second most problematic substance.

Data Collection

After a screening interview, veterans who met the project criteria described above were told, by trained research interviewers employed by the university and separate from the clinical staff, that participation in the project was voluntary and would not affect any services for which they were eligible. Those who agreed to participate completed a series of personal interviews at treatment admission, discharge from treatment, and again 1, 3, 6, 12, 18, and 24 months after discharge from treatment. Participants were paid \$40 for the initial interview and \$30 for each of the follow-up interviews; no payment was made for the discharge interview. This study examined data from the admission, discharge and six month interviews.

Instrumentation

The University of Rhode Island Change Assessment Scale (URICA) was used to identify clusters of subjects relative to their readiness for change (13). The instrument consists of 32 items, eight items related to each of the four stages of change. All items have a 5-point Likert type response (1 = Strongly disagree to 5 = Strongly agree). Each stage scale has possible scores between 8 and 40.

Composite scores from the Addiction Severity Index, Version 5 (23) were used to measure subjects' functioning in the 30 days prior to treatment

admission and the six-month follow-up interview. The composite scores represent functioning in seven life domains—medical, employment, alcohol, drug, legal, family, and psychiatric—and have been shown to be both reliable and valid indicators of substance users' functioning levels (23,24). Questions common to each domain include the number of days when subjects experienced a particular problem in a domain (e.g., drug use) in the last 30 days, subjects' ratings on how troubled they were by the problem, and how important treatment or counseling is to them for that problem (25). In addition, other questions, specific to each domain are used to create the composite score. For example, the drug use severity composite score is computed based on 13 questions that determine the frequency and consequences of drug use in the last 30 days.

Data Analysis

Mean scores for each of the four URICA stage scales were computed for intake, discharge, and six-month follow-up. Cronbach's alpha statistic was utilized in this study to test for the internal consistency of each URICA stage scale, resulting in an alpha value of .79, .83, .85, and .76 for the precontemplation, contemplation, action, and maintenance scales, respectively. Analysis of Variance (ANOVA) was used to detect potential changes between treatment admission, discharge, and six-month follow-up for the whole sample population.

A cluster analysis was conducted using the intake mean scores for each stage in order to identify homogeneous groups or clusters. Specifically, a hierarchical clustering technique with the Ward method was used. This method uses Euclidian distances as measures of similarity and forms clusters with the criterion of minimizing variances within clusters (26,27). Several treatment admission variables were then used to compare the clusters, including gender, race/ethnic background, marital status, years of education, age, maintaining steady employment, legal system involvement, cocaine/crack cocaine as most problematic substance, and previous alcohol or drug user treatment. Cluster comparisons on ASI scores were conducted in two dimensions. The ASI mean composite scores for each of the three clusters were compared at both intake and six-month follow-up using ANOVA. Changes in composite scores between intake and six-month follow-up were also analyzed for each cluster and the entire sample via repeated measures t-tests. All analyses were performed using SAS for Windows.

RESULTS

Mean Scores on the Four Stage Scales

Table 1 presents mean scores for the four stages at intake, discharge from treatment and six months following discharge. No significant difference was observed between intake and discharge for any of the stages, suggesting that treatment did not affect, as a group, subjects' reported perceptions about their readiness for change. In contrast, mean scores at the six-month follow-up interview changed significantly from both intake and discharge scores, showing a significant overall increase in the precontemplation score, and a decline in the contemplation, action, and maintenance scores.

Description of Clusters

Cluster analysis yielded three distinct, interpretable groups. A Preparation cluster ($N=50$) included those subjects who had above average scores on precontemplation and below average scores on the three other stages. The 122 subjects in the Participation cluster were characterized by above average scores on both contemplation and action stages and below average scores in precontemplation and maintenance. The Maintenance cluster ($N=63$) exhibited above average scores on contemplation, action, and maintenance. The scores on the maintenance scale were particularly high for this group.

Table 2 provides comparisons of demographic, criminal justice, and substance use specific variables for each of the three clusters. Generally, no

Table 1. Mean Values of Stage Sub-scales at Intake, Discharge, and Six-Month Follow-up

Stage scale	Mean scores			F Value
	Intake	Discharge	Six-month	
Precontemplation	12.79	12.60	14.28 ^a	13.33***
Contemplation	36.28	36.11	32.48 ^a	84.92***
Action	35.00	35.74	32.02 ^a	44.53***
Maintenance	31.27	31.58	28.65 ^a	25.71***

*** $p \leq .001$.

^aDuncan's multiple range tests indicate that average scores of the four stage scales were significantly different at six-month than that from intake and discharge.

Table 2. Baseline Comparison of Three Clusters

	Preparation (<i>N</i> = 50)	Participation (<i>N</i> = 122)	Maintenance (<i>N</i> = 63)	<i>p</i>
Male	98.0%	97.5%	100%	.46
African-American	68.0%	68.0%	69.8%	.96
Married	12.0%	10.7%	11.1%	.97
Having a steady job	26.0%	21.3%	17.5%	.54
Legal system involvement	44.7%	31.6%	32.3%	.26
Cocaine/crack cocaine as most problematic substance	56.0%	55.4%	47.6%	.56
Previous treatment	72.0%	68.0%	87.3%	.02
Mean age	44.9	41.6	43.5	.01
Mean education	11.7	12.3	12.3	.12

significant differences were found on any of these variables with the exception of age and previous treatment involvement. Members of the Participation cluster were approximately three and two years younger than the Preparation and Maintenance clusters respectively. Subjects in the Maintenance cluster were more likely to have previous alcohol or drug treatment than the other two groups.

Cluster Comparison on ASI Outcome Indicators

As shown in Table 3, only two significant differences were found between the three clusters. Surprisingly, at intake the Maintenance cluster had a significantly higher severity score on the drug use composite than the Preparation cluster; the Preparation cluster reported more severe employment problems than the Participation group at six-month follow-up. Overall the three clusters reported very similar levels of functioning in the seven ASI domains at both intake and six-month follow-up.

Table 4 provides a comparison of the intake and six-month composite scores for each cluster and for the entire sample. For the sample as a whole, repeated measures t-tests showed significant improvements in all ASI composite scores between the intake and six-month follow-up interviews. Examining clusters individually, we found that all three clusters demonstrated significant improvements in areas measured by the ASI, except employment for the Preparation cluster and legal status for the Maintenance cluster.

Table 3. Results from ANOVA on ASI Scores at Intake and Six-Month Follow-up, by Three Clusters

Cluster	ASI composite scores						
	Medical	Employment	Alcohol	Drug	Legal	Family	Psychiatric
<i>At intake</i>							
Preparation	.31	.69	.47	.26	.29	.25	.33
Participation	.28	.63	.57	.29	.24	.25	.31
Maintenance	.31	.67	.58	.32	.19	.28	.29
F Value	0.13	0.80	2.19	3.40*	2.58	0.32	0.29
<i>At six-month follow-up</i>							
Preparation	.13	.64	.16	.08	.17	.12	.15
Participation	.21	.49	.18	.10	.12	.14	.17
Maintenance	.19	.57	.15	.09	.15	.15	.14
F Value	1.11	5.52*	0.40	0.79	1.53	0.40	0.44

* $p \leq .05$.

Table 4. Results from T-Tests on ASI Scores Between Intake and Six-Month Follow-up Within Each of the Three Clusters

Cluster	ASI composite scores						
	Medical	Employment	Alcohol	Drug	Legal	Family	Psychiatric
<i>Preparation (N = 50)</i>							
Intake	.31	.69	.47	.26	.29	.25	.33
Six-month	.13**	.64	.16***	.08***	.17**	.12**	.15***
<i>Participation (N = 122)</i>							
Intake	.28	.63	.57	.29	.24	.25	.31
Six-month	.21*	.49***	.18***	.10***	.12***	.14***	.17***
<i>Maintenance (N = 63)</i>							
Intake	.31	.67	.58	.32	.19	.28	.29
Six-month	.19*	.57*	.15***	.09***	.15	.15***	.14***
<i>All Clusters (N = 235)</i>							
Intake	.30	.66	.55	.29	.24	.25	.31
Six-month	.18***	.55***	.17***	.09***	.14***	.14***	.16***

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

DISCUSSION

It was the intent of this study to examine *readiness for change* with in-treatment crack cocaine users. For the most part the results of this study did not confirm prevailing findings and assumptions about readiness to change, at least as measured by the four-stage, 32-item URICA. Whether this is due to the instrument itself or a substantially different process whereby substance users, in our case crack cocaine users, approach treatment is unclear.

We were quite surprised to discover counterintuitive changes in the movement in readiness for change for the entire sample between admission and completion of treatment one month later. There were no significant changes between admission and completion on any of the four stages. Intuitively, it would appear that during treatment these drug use treatment clients would have exhibited growing involvement with the treatment process and therefore move into the more motivated, or ready for treatment categories. This proved not to be the case in this study with mean scores remaining flat from intake to discharge.

Our clusters represent three groups of cocaine users who at admission to treatment were in the precontemplation, participation, and maintenance stages of change. These clusters were fairly consistent with the groups identified in other studies (13,19). Parallel to our findings, these studies identified a group with lower scores than other groups on the precontemplation stage and higher scores on the remaining three scales and a group with above average on precontemplation and much lower on the other three scales. Characteristics of a middle group, those individuals with some degree of ambivalence about change, were inconsistent between this and other studies.

The lack of differences between clusters on ASI composite scores suggests that level of functioning is not related to readiness for change, either at admission to treatment or six months following treatment. The treatment admission finding may indicate that substance users readiness to make changes is independent of the degree of impairment they are experiencing due to the consequences of substance use. The apparent absence of a relationship between clinical presentation and motivation has been noted in other studies of substance users (19).

The finding that the three clusters do not differ significantly at six months following treatment (with the exception of employment functioning) is somewhat harder to explain. Conventional wisdom would suggest that those individuals who are in the Preparation group, and not yet ready to make a commitment to change, would differ substantially from substance users who were beginning to change or who were maintaining changes they had already made. Further, each of the three clusters showed significant

changes between treatment admission and six-month follow-up on virtually all of the seven domains of functioning measured by the ASI. While members of the Participation and Maintenance clusters would be expected to show this improvement, we were surprised that Preparation group members demonstrated a like amount of improvement.

There are several possible explanations for these findings. First, it may be that the stages of change model does not capture the nature of change in this population. This would account for the findings that these substance users did not demonstrate the expected changes in stage scores between treatment admission and follow-up. Further, the equal improvements in treatment outcomes experienced between members of all three clusters would lead us to believe that readiness for change and success in treatment may be independent of each other, at least in this population.

While the findings of this study appear to call into question the utility of the stages of change model for these in-treatment crack cocaine users, there may be alternative explanations. It may be that while the stages of change model is sound, the URICA scale is not appropriate for these substance users and therefore we are not getting a meaningful representation of their status. A second explanation is that the scale is adequately measuring the dimensions of interest, but the treatment process is designed to change specific behaviors such as drug use while having little impact on readiness for change. This might begin to explain why the six-month follow-up data demonstrated a drift towards precontemplation even though the ASI documented that positive changes occurred in virtually all dimensions across all three clusters.

Although puzzling, these results are interesting. Using similar descriptive techniques, it would be worthwhile to determine whether other researchers produced findings similar to the ones presented here. Of value would be efforts where the severity of substance use problems are analytically controlled and the results compared. In addition, the apparent age differences in the different clusters raise interesting questions about timing treatment interventions at different stages in a substance users career. Similarly, the clustering of those with prior treatment experience in the maintenance group might point to the necessity—or inevitability—of offering substance users multiple treatment opportunities. Such findings, could help inform testable models of readiness for treatment and varying drug user treatment technologies. Finally, given the recent interest in and support of community outreach and harm reduction activities directed at drug using populations at risk for HIV infection, identifying and perfecting ways of attracting and holding these people into treatment is essential. Understanding the relationship between motivation to change and the intervention actually delivered could be an important step in maximizing intervention resources.

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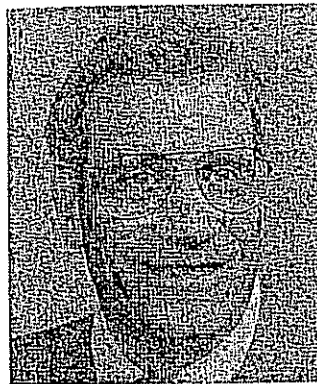
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