

A Measure of Readiness for Substance Abuse Treatment

Psychometric Properties of the RAATE-R Interview

Lisa M. Najavits, Ph.D., David R. Gastfriend, M.D.,
Emilie Y. Nakayama, B.A., Jacques P. Barber, Ph.D.,
Jack Blaine, M.D., Arlene Frank, Ph.D.,
Larry R. Muenz, Ph.D., Michael Thase, M.D.

The Recovery Attitude and Treatment Evaluator-Research (RAATE-R) scale is a structured interview that assesses readiness for substance abuse treatment in five subscales: resistance to treatment, resistance to continuing care, biomedical acuity, psychological acuity, and environmental/social problems. Psychometric properties, based on an interrater reliability analysis of 23 raters and administration of the scale to 116 cocaine-dependent outpatients, included high interrater reliability, high internal consistency, independence of subscales, and a factor structure that partially supports the scale's original design. The authors discuss limitations of these conclusions and the lack of concurrent validity with a self-report measure of therapy readiness. (American Journal on Addictions 1997; 6:74-82)

Readiness for substance abuse treatment is widely hypothesized to be one of the most important determinants of patient outcome.¹ The Recovery Attitude and Treatment Evaluator (RAATE)² was developed for assessment of substance abusers' treatment readiness in five subscales: resistance to treatment, resistance to continuing care, biomedical problems, psychological

problems, and social and environmental problems. It is a structured interview intended for serial use over the course of recovery. Its development relied on clinical observation of key issues necessary for matching patients to adequate treatment, as well as a review of admissions criteria of various substance abuse treatment facilities and insurance companies (rather than on

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FIGURE 1. Samp

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Received June 12, 1995; revised November 6, 1995; accepted April 25, 1996. From the Harvard Medical School and the Alcohol and Drug Abuse Treatment Center, McLean Hospital. Address correspondence to Dr. Najavits, Proctor 3, McLean Hospital, 115 Mill St., Belmont, MA 02178 (e-mail: Lnajavits@aol.com).

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any theoretical model).² The 28 items on the scale address cognitive, interpersonal, behavioral, medical, and psychiatric issues relevant to readiness, rated on a four-point scale (see Figure 1). Psychometric characteristics of self-report and interview versions of the scale have been previously reported.^{2,3}

A subsequent research version of the instrument, RAATE-Research (RAATE-R; Gastfriend DR and Najavits LM, adapted from the original RAATE²) offers more rigorous assessment by adding a structured

interview format, probe questions, and descriptive anchors for each section. The instrument was refined based on raters' feedback about their experience with the scale, consultation with the original RAATE's authors, and interrater reliability and frequency data.

Although other instruments have been developed to assess substance abuse treatment readiness, and in many cases have achieved good psychometric validation, none appear to match the characteristics of the RAATE-R. The Addiction Severity Index

FIGURE 1. Sample questions from the RAATE-R

Section B: Resistance to Continuing Care

- ⇒ (i) "How much do you feel that your alcohol or drug problems will be resolved by this treatment?"
- (ii) (Omit if concluding treatment) "What is the likelihood that you will be in treatment in 90 days?" "Why or why not?"

B1: DOES THE PATIENT REALIZE THAT RECOVERY IS AN ONGOING PROCESS REQUIRING PERSONAL RESPONSIBILITY?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
YES	SOMEWHAT	A LITTLE	NO
<i>most healthy</i>			<i>most impaired</i>
Seriously considers personal responsibility issues	Superficial or limited awareness of responsibility	Over-optimistic reliance on treatment (i.e., "pink cloud")	Believes that "someone else" is primarily responsible for recovery (staff, family, etc.)

Section E: Social/Family Environmental Status

- ⇒ "Are your friends and the people you hang out with free from drugs? Are they supportive of your efforts to get clean?"

E2: DO THE PATIENT'S FRIENDS AND SOCIAL NETWORK APPEAR TO BE RESOURCES TO THE PATIENT FOR TREATMENT AND RECOVERY?

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4
YES	SOMEWHAT	A LITTLE	NO
<i>most healthy</i>			<i>most impaired</i>
Friends are clean, sober, and highly supportive of patient's recovery	Friends generally well-meaning, but may be unfamiliar with principles of recovery and pose potential hazards	Some friends are substance abusers or not supportive of the recovery process	No friends, or most are substance abusers or will actively sabotage recovery, or social network chaotic or nonexistent

Note: Probe items (marked by arrows) are directly asked of patients, followed by scored items (small numbered boxes), which are rated by the interviewer along a four-point range, according to anchor descriptions for each value. Subscale scores are averages of scored items, and total scores are averages across all subscales.

(ASI),⁴ perhaps the most widely used substance abuse interview, preceded the RAATE-R in identifying major functional living domains that are relevant to substance abuse treatment (drug/alcohol, family/social, legal, employment, psychiatric, and medical). However, its focus is on severity of problems rather than readiness for treatment. Also related are instruments based on the transtheoretical model of change,⁵⁻⁷ which specifies five stages of readiness to benefit from substance abuse treatment: precontemplation, contemplation, action, maintenance, and relapse. However, because these scales are entirely intrapsychic, they do not (unlike the RAATE-R) evaluate external factors that are believed to influence treatment outcome, such as the potential of severe medical conditions, to distract from recovery efforts or family tendencies to sabotage treatment.⁸

The Circumstances, Motivation, Readiness, and Suitability Scales for Substance Abuse Treatment (CMRS)⁹ is closest to the RAATE-R in tapping both internal and external factors in treatment readiness, but it was designed primarily for long-term residential treatment populations; its reliability and validity in other settings remain to be demonstrated. Denial,¹⁰ outcome expectancy,¹¹ and locus-of-control¹² have also been studied in substance abuse samples. Although important, these unitary cognitive constructs are more narrow than the factors in the RAATE-R. Also, all of the above except the ASI are solely self-report measures, which may be problematic for substance abuse patients whose self-appraisal may be subject to distortion by the disease.

It is as yet unknown what measures, or combination of measures, are needed to assess treatment readiness in addicted patients. Our goal in this study was to evaluate the basic psychometric properties of the RAATE-R, as a precursor to evaluating its utility in clinical settings. Specifically, we address the interrater reliability, factor structure, internal consistency,

intercorrelation of subscales, and convergent validity of the RAATE-R. Interrater reliability is of particular concern in an instrument that relies on rater interpretation of patient's self-report of treatment readiness; thus, this property received primary emphasis in this study.

METHODS

Interrater reliability on the RAATE-R was assessed for 23 raters (2 psychiatrists, 3 doctoral-level psychologists, 5 master's-level psychologists or social workers, and 13 bachelor's-level raters). All raters were trained on the instrument as part of the pilot phase of the National Institute on Drug Abuse (NIDA) Collaborative Cocaine Treatment Study (NCCTS).¹³ The NCCTS is a randomized, controlled, multisite clinical trial to assess the efficacy of four psychosocial treatments for cocaine-dependent outpatients conducted over 6 months: individual cognitive therapy, individual supportive-expressive therapy, individual 12-step drug counseling (each in conjunction with group 12-step drug counseling), and group 12-step drug counseling. During the pilot phase of the study, staff were trained and protocols were developed. The RAATE-R is part of the study battery, administered at postrandomization and Months 1, 3, and 6. Raters learned the RAATE-R by reading the original RAATE manual,² viewing a training videotape developed for the RAATE-R, administering the instrument at least once, and attending a supervisory conference call with the authors of the RAATE-R (LMN and DRG). Eighteen of the raters had previous experience on an earlier version of the RAATE-R. The rater pool included the authors of the RAATE-R.

Interrater reliability was assessed for four videotaped interviews of the RAATE-R, conducted with substance abuse patients whose treatment represented each of the four levels of the American Society of Addiction Medicine's Patient Placement

Criteria for the Treatment Readiness for Substance Use (TRSU) scale. These ranged from Level 1 (no treatment) through medically supervised treatment (Level 4). Interviews were conducted by four raters from the NIDA Collaborative Cocaine Treatment Study. The RAATE-R interview was conducted independently of the other three interviews.

To assess intraclass correlation, we calculated RAATE-R total score and subscale scores across four levels separately. The scores were then compared to the scores of the 10 professional raters (with a master's degree or higher) who were trained separately from that of the other raters. Finally, we compared the scores to the scores of the 10 nonprofessional raters. The scale (DRG) weighted kappa corrected percent agreement was calculated.

Further statistical analyses were conducted on a sample of 100 patients who were administered the RAATE-R at baseline assessment. Internal consistency of each subscale was assessed. The RAATE-R scores were correlated to assessment of treatment readiness and a factor analysis was conducted. The a priori subscale structure was validated empirically with an exploratory factor analysis.

TABLE 1. Interrater Reliability

Education
Professional
Nonprofessional
All levels

Note: RAATE-R = Readiness for Substance Abuse Treatment; Subscale = Circumstances, Motivation, Readiness, and Suitability Scales for Substance Abuse Treatment. All values are intraclass correlation coefficients. * $P \leq 0.001$.

Criteria for the Treatment of Psychoactive Substance Use Disorders (ASAM-PPC);¹⁴ these ranged from outpatient (Level 1) through medically managed intensive inpatient care (Level 4). Target interviews were conducted by four experienced NIDA Collaborative Cocaine Treatment Study RAATE-R interviewers. All 23 raters independently completed the RAATE-R for the four interviews.

To assess interrater reliability, the intraclass correlation was calculated for the RAATE-R total score and each of its five subscales, across patient levels and for each level separately. The interrater reliability of the 10 professional-level raters (master's degree or higher) was also calculated separately from that of the 13 nonprofessional raters. Finally, each rater's results were compared to those of the first author of the scale (DRG) on each item using the weighted kappa, a statistic of chance-corrected percent agreement.¹⁵

Further statistical analysis was conducted on a sample of 116 NCCTS patients who were administered the RAATE-R at the baseline assessment of the study. The internal consistency of the total scale and each subscale was assessed using Cronbach's alpha. All RAATE-R subscales were also intercorrelated to assess their independence, and a factor analysis determined whether the a priori subscales of the RAATE-R could be validated empirically. To test concurrent validity with another instrument designed

to measure similar constructs as the RAATE-R, the RAATE-R was correlated with the CMRS. The CMRS is a 36-item self-report questionnaire assessing patients' motivation and readiness for treatment; it was administered concurrently with the RAATE-R.

RESULTS

Interrater Reliability

Table 1 shows the intraclass correlations of the RAATE-R total score (0.90) and of each of the five subscales (mean = 0.79; range: 0.66 to 0.92) for the entire sample of raters across all four cases. All values were significant, and at or above 0.61, indicating high interrater reliability (see Table 1). The level of agreement among the professional raters was higher than among the nonprofessional raters on the total score and on three subscales; thus, professional training offers a slight increment in reliability. Subscales A and B produced relatively the lowest reliability, which may be due to their more interpretive nature (e.g., personal responsibility and predictions of relapse risk). Subscales C and E, in contrast, contain more objective items.

Comparison of Each Rater With an Expert Rater

Each rater was individually compared with the expert rater (DRG) by use of the

TABLE 1. Interrater reliability (kappa) for RAATE-R scales by professional level

Education	n	RAATE-R Scales					
		Total	Subscale A	Subscale B	Subscale C	Subscale D	Subscale E
Professional	10	0.93*	0.70*	0.66*	0.90*	0.88*	0.89*
Nonprofessional	13	0.88*	0.61*	0.66*	0.80*	0.82*	0.93*
All levels	23	0.90*	0.66*	0.67*	0.84*	0.84*	0.92*

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research; Subscale A = Resistance to Treatment; Subscale B = Resistance to Continuing Care; Subscale C = Biomedical Problems; Subscale D = Psychological Problems; Subscale E = Social and Environmental Status.

All values are intraclass correlations across all four taped interviews. Professional-level raters have doctoral or master's degrees, and nonprofessional-level raters have bachelor's degrees.

* $P \leq 0.001$.

intraclass correlation-emulating kappa. For individual kappa scores, the medians and quartiles are shown across the four target videotapes in Table 2. These values indicate that not only were raters attaining similar ratings (as per the interrater reliability reported above), but they were also providing ratings in an expert way. However, there appeared to be variability in performance due to the clinical severity of the taped case, with the Level 1 tape achieving the lowest reliability. It would normally be expected that higher levels, indicating greater patient severity, would be the most difficult cases to rate; yet, it may well be the case that discrimination of treatment readiness issues is more subtle and complicated at the less severe end of the spectrum. A statistical artifact is suggested by the fact that the less severe target videos (Levels 1 and 2) yielded ratings that were close to the bottom of the scale, with less variability in scores than the more severe videos (Levels 3 and 4), thereby suppressing reliability.

Internal Consistency

The Cronbach alphas were as follows: total score = 0.77; subscales A = 0.45; B = 0.63; C = 0.58; D = 0.62; and E = 0.71. These findings suggest consistency for the scale as a whole, thus lending credence to the concept of treatment readiness as a cohesive construct. Subscales A and C ap-

TABLE 2. RAATE-R reliability kappas across four target cases

Videotape	Median	25th Percentile	75th Percentile
1	0.58	0.46	0.68
2	0.73	0.69	0.80
3	0.68	0.64	0.75
4	0.89	0.84	0.90
All	0.81	0.78	0.83

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research.

pear weakest. It is as yet unclear whether this reflects a need for refinement of those subscales, or whether it is an artifact of a restricted sampling bias (i.e., in this study, all patients had already volunteered for treatment and were ineligible if they had major medical problems). The lower alphas of some of the subscales may also reflect a limited item pool for subscales A through D; that is, the number of items on these subscales range from 3 to 7, in contrast to subscale E, which comprises 11 items. A correction for this difference was performed by applying the Spearman-Brown prophecy formula,¹⁶ using a hypothetical number of 11 items per subscale, based on the finding that subscale E (with 11 items) demonstrated sufficient internal consistency. With this correction, the expected Cronbach's alphas for the five RAATE-R subscales became 0.63, 0.82, 0.83, 0.78, and 0.71, respectively.

Subscale Intercorrelations and Frequency Distributions

Intercorrelations between the subscales were all low (range: 0.04 to 0.41). That the subscales were largely independent can be interpreted as desirable in that each subscale thus potentially serves a unique function. Significant correlations were found between subscales A and B and between subscale E and both B and D (see Table 3).

Frequency distributions indicate that the total score and subscales A, C, and D appeared to show a ceiling effect: that is, most ratings did not exceed the level of 2 on the 4-point scale. Specific percentages of ratings less than or equal to 2 (and 90th percentile value scored) were 90% (2.07) for total score; 100% (1.80) for subscale A; 97% (2.00) for subscale C; and 91% (2.00) for subscale D. Subscales B and E showed only 51% (3.00) and 45% (2.85), respectively, indicating much wider use of the range of the scale.

TABLE 3. Intercorrelations

	K
Subscale A	0.04
Subscale B	0.41
Subscale C	0.04
Subscale D	0.04
Subscale E	0.04

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research; Subscale = Psychological Problem Solving.
*P ≤ 0.05; **P ≤ 0.01; ***P ≤ 0.001.

Con
With

Correlation and the CMRS was significant for total score, indicating a lack of association between the two measures. Surprisingly in that we were assessing the same construct, the correlation for treatment readiness was currently to the same as the correlation between the two, however, was dependent therapy. The measure is more geared to the interviewer judgment.

F

An exploratory factor analysis was performed on the total score (N = 116) via principal component analysis with varimax rotation. Although nine eigenvalues above 1.0, a one-factor solution was identified as the most appropriate. Each eigenvalue over 1.0 accounted for the variance. Factor loadings indicate the topics of the subscales: "psychological

TABLE 3. Intercorrelation of RAATE-R subscales and total score ($N = 116$)

	Total	Subscale A	Subscale B	Subscale C	Subscale D	Subscale E
Subscale A	0.56**					
Subscale B	0.71***	0.42***				
Subscale C	0.41***	0.14	0.09			
Subscale D	0.54***	0.17	0.09	0.04		
Subscale E	0.68***	0.13	0.28**	0.08	0.35***	

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research; Subscale A = Resistance to Treatment; Subscale B = Resistance to Continuing Care; Subscale C = Biomedical Problems; Subscale D = Psychological Problems; Subscale E = Social and Environmental Status.

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$.

Concurrent Validity With the CMRS Scale

Correlations between the RAATE-R and the CMRS were low and nonsignificant for total and subscale comparisons, indicating a lack of correspondence between the two measures. This finding was surprising in that both measures ostensibly assess the same global constructs of readiness for treatment and both were given concurrently to the same patients. The CMRS, however, was developed for an opioid-dependent therapeutic community sample, is more geared to residential settings, and is entirely a self-report measure, without the interviewer judgment that the RAATE-R provides.

Factor Analysis

An exploratory factor analysis was performed on the total scale at baseline ($N = 116$) via principal-components analysis with varimax rotation (see Table 4). Although nine factors were extracted with eigenvalues above 1, a four-factor orthogonal solution was chosen so that we could identify the most basic elements of the instrument. Each of the four factors had eigenvalues over 2, accounting for 40% of the variance. Factors 1, 3, and 4 appear to replicate the topics of three of the RAATE-R's a priori subscales: Factor 1 can be labeled "psychological problems"; Factor 3, "family

and environmental problems"; and Factor 4, "biomedical problems." Indeed, Factors 3 and 4 largely comprise items defined a priori on the associated RAATE-R subscales (E and C, respectively). Factor 2 appears to represent "acceptance of drug/ alcohol problems" because it largely comprises items that query patients' attitudes toward relapse, recovery activities, and acceptance of substance abuse problems.

DISCUSSION

Improving treatment outcomes among substance abuse patients is a complicated task. The RAATE-R was designed to assist this effort by helping to identify patients' level of readiness for substance abuse treatment on five dimensions that span the range from internal, psychological responsiveness to external factors (such as environmental and medical problems). If shown to have adequate psychometric properties, it could complement existing measures of substance abuse severity, such as the ASI, to produce a sophisticated profile of those who might benefit most from treatment.

Data from this study indicate that the RAATE-R subscales achieve moderate internal consistency. Most subscales also demonstrated independence, which is desirable in that each subscale thus serves a unique construct within the scale. Despite the relatively low sample size in this study's

intraclass correlation-emulating kappa. For individual kappa scores, the medians and quartiles are shown across the four target videotapes in Table 2. These values indicate that not only were raters attaining similar ratings (as per the interrater reliability reported above), but they were also providing ratings in an expert way. However, there appeared to be variability in performance due to the clinical severity of the taped case, with the Level 1 tape achieving the lowest reliability. It would normally be expected that higher levels, indicating greater patient severity, would be the most difficult cases to rate; yet, it may well be the case that discrimination of treatment readiness issues is more subtle and complicated at the less severe end of the spectrum. A statistical artifact is suggested by the fact that the less severe target videos (Levels 1 and 2) yielded ratings that were close to the bottom of the scale, with less variability in scores than the more severe videos (Levels 3 and 4), thereby suppressing reliability.

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TABLE 3. Intercorrelations

	Treatment
Subscale A	0.04
Subscale B	0.41
Subscale C	0.04
Subscale D	0.04
Subscale E	0.41

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research; Subscale = Psychological Proficiency. *P ≤ 0.05; **P ≤ 0.01.

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TABLE 4. RAATE-R factor analysis (N = 116)

RAATE-R Item (and original subscale)	Factors			
	1	2	3	4
Can focus on treatment despite psychological symptoms. (D)	0.70			
Presence of Axis I psychological symptoms. (D)	0.63			
Danger of relapse if moved to a lower level of care. (E)	0.57			
Social network is a resource for recovery. (E)	0.54			
Psychological symptoms are viewed as a normal part of recovery. (D)	0.51			
Patient's family can benefit from treatment. (E)	0.49		0.45	
Open to addiction treatment. (A)	0.46			
Can live in environment without relapse. (E)	0.45	0.34		
Likely to lose focus on recovery because of other life problems. (E)	0.43			
Connection with recovery activities. (B)	0.36	0.36		
Presence of Axis II psychological symptoms. (D)	0.35			
Social skills deficits. (E)	0.30			
Psychological symptoms require treatment. (D)				
Demonstrates acceptance of addiction problem. (A)		0.72		
Can identify two or more addiction-related problems. (A)		0.70		
Realistic about relapse dangers. (B)		0.65		
Active planning to avoid relapse. (B)	0.31	0.64		
Realizes recovery is an ongoing process. (B)	0.31	0.55		
Decided to participate in treatment. (A)		0.33	0.33	
Has non-using leisure activities. (E)		0.32		
Family willing to participate in patient's recovery. (E)			0.73	
Family emotionally supportive of recovery. (E)			0.70	
Work/school supportive of recovery. (E)			0.59	
Daily structure promotes abstinence. (E)			0.50	
External pressure to stay in treatment. (A)	0.41		-0.49	
Medical problems. (C)				0.86
Medical problems require medical care. (C)				0.78
Medical problems interfere with treatment. (C)				0.63

Note: RAATE-R = Recovery Attitude and Treatment Evaluator-Research; Subscale A = Resistance to Treatment; Subscale B = Resistance to Continuing Care; Subscale C = Biomedical Problems; Subscale D = Psychological Problems; Subscale E = Social and Environmental Status.

factor analysis, results are quite consistent with a factor analysis recently completed using an interview version of the original RAATE (the RAATE-CE³ on a sample of 662 addicted patients (Doyle SS: Patient-treatment matching in substance abuse treatment: rationale, criteria, and instrumentation. Unpublished dissertation, University of Minnesota, 1995.) Six factors were identified in that study: resistance to treatment and continuing care, acuteness of biomedical problems, presence of an emotional

problem, psychosocial environment—social, psychosocial environment, and chronic mental disorder.

The RAATE-R also addresses the challenge of interrater reliability through a structured interview design, probe items for each question, and scaling that is made more specific through descriptive anchors. The data indicate that interrater reliability has been adequately achieved in this version of the instrument when combined with a standardized training procedure. This

finding is particularly important because it has been obtained from different centers and professional training in reliability, but the lay interviewers' abuse experience reliability.

Those subscales that assess internal patient treatment (subscale C) had the lowest reliability, more interpretive subscales that focus on conditions such as non-compliance (subscale C) or substance use and friends (subscale E).

Some limitations are relevant. The use of patient severity as a stratification test of interrater reliability (stratifying RAATE-R video, did not differ between different severity levels). The RAATE-R J was found to be consistent with the lower-severity group was found to be consistent with the effect that limited the severity range occurred in the that were used to explain the variations between patients who c explained by the NCCTS population patients who c psychopharmacologic treatment rigorous study. Therefore, further populations in of severity. Rai populations w variance on a would suggest or provide ad Directly mea: ity of patient:

finding is particularly meaningful because it has been obtained across raters of varying skill and experience levels and across different centers and cities. As expected, professional training offers a slight increment in reliability, but this is only slight and even lay interviewers with minimal substance abuse experience achieve good levels of reliability.

Those subscales of the RAATE-R that assess internal psychological readiness for treatment (subscales A and B) yield the lowest reliability, which may be due to their more interpretive nature, in contrast to subscales that focus more on external conditions such as need for medical visits (subscale C) or substance abuse among family and friends (subscale E).

Some limitations of the study are relevant. The use of target videos with varying patient severity levels provided an excellent test of interrater reliability but, by constraining RAATE-R administrations to video, did not actually test reliability between different raters' test administration. The RAATE-R produced lower reliability with the lower-severity target videos. This was found to be due to a statistical ceiling effect that limited variance at the bottom of the severity range. A similar ceiling effect occurred in the frequency distributions that were used to examine the intercorrelations between subscales. These may be explained by the restriction of range in the NCCTS population: by design, all were outpatients who did not require concurrent psychopharmacological or psychotherapeutic treatment and who agreed to the rigorous study demands and schedule. Therefore, further work is needed with populations incorporating a broader range of severity. Ratings of more severe patient populations would likely lead to increased variance on all the subscales; or, if not, would suggest the need to revise the scale or provide additional training to raters. Directly measuring the social desirability of patients' responses may also be

useful because that may also serve as a confounding factor.

All interpretations, however, are clearly tentative and will require more extensive evaluation over multiple samples and comparable versions of the instrument. For example, the apparent lack of correspondence between the RAATE-R and the CMRS may be related to their different administration methods (interview vs. self-report questionnaire) and study populations (cocaine-dependent outpatients vs. opiate-dependent long-term residential patients). Also, the RAATE-R must undergo validity testing to specify the relationship between its scores and clinical outcomes. This work is under way in the NIDA Collaborative Cocaine Treatment Study.

We acknowledge the assistance of Doug Fitzgerald for his kappa statistic software. The contributions of John Boren, Ph.D., the NIDA project officer for this cooperative agreement, are also gratefully acknowledged.

The NIDA Collaborative Cocaine Treatment Study is a National Institute on Drug Abuse-funded Cooperative Agreement involving four clinical sites, a Coordinating Center, and NIDA staff. The Coordinating Center at the University of Pennsylvania includes Paul Crits-Christoph, Ph.D. (PI), Lynne Sigueland, Ph.D. (Project Coordinator), Karla Moras, Ph.D. (Assessment Unit Director), Jesse Chittams, M.A. (Director of Data Management/Analysis), and Larry R. Muenz, Ph.D. (Statistician). The collaborating scientists at the Treatment Research Branch, Division of Clinical and Research Services at NIDA are Jack Blaine, M.D., and Lisa S. Onken, Ph.D. The four participating clinical sites are University of Pennsylvania (Lester Luborsky, Ph.D. [PI], Jacques P. Barber, Ph.D. [Co-PI], Delinda Mercer, M.A. [Project Director]); Brookside Hospital (Arlene Frank, Ph.D. [PI], Stephen F. Butler [Co-PI], Sarah Bishop, M.A. [Project Director]);

Harvard Medical School/McLean Hospital and Massachusetts General Hospital (Roger D. Weiss, M.D. [PI], David R. Gastfriend, M.D. [Co-PI], Lisa M. Najavits, Ph.D. [Project Director]); University of Pittsburgh/Western Psychiatric Institute and Clinic (Michael Thase, M.D. [PI], Dennis Daley, M.S.W. [Co-PI], Isban M. Salloum, M.D. [Co-PI], and Judy Lis, M.S.N [Project Director]). The Training Unit Heads of the Cognitive Therapy Training Unit are Aaron T. Beck, M.D. (University of Pennsylvania), and Bruce S. Liese, Ph.D. (University of Kansas Medical Center); the Heads of the Supportive-Expressive Therapy Training Unit are Lester Luborsky, Ph.D., and David Mark, Ph.D. (University of Pennsylvania); Heads of Individual Drug Counseling are

George Woody, M.D. (Veterans Administration/University of Pennsylvania Medical School), and Delinda Mercer, M.A (University of Pennsylvania); and Heads of the Group Drug Counseling Unit are Delinda Mercer, Dennis Daley (University of Pittsburgh/Western Psychiatric Institute and Clinic), and Gloria Carpenter, M.Ed. (Treatment Research Unit, University of Pennsylvania). The Monitoring Board consists of Larry Beutler, Ph.D., Jim Klett, Ph.D., Bruce Rounsaville, M.D., and Tracie Shea, Ph.D.

The preparation of this manuscript was funded in part by NIDA grants U18-DA07090, U18-DA07633, U18-DA07673, U18-DA07693, U18-DA07085, and DA-08631; and NIMH Career Development Award K02-MH00756.

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