Routledge
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# Exploring the Factor Structure of a Recovery Assessment Measure among Substance-Abusing Youth

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**Abstract** — To date, the measurement of recovery in the field of substance abuse is limited. Youth recovery from substance abuse is an important area to consider, given the complexities of such issues. The Recovery Assessment Scale (RAS) has been validated with mental health patient populations; however, its measurement characteristics have not been examined for individuals in substance abuse treatment. The current study explored the factor structure of the RAS with a sample of 80 substance-abusing youth who participated in a pilot aftercare study ($M_{age}$ 20.5, $SD = 3.5$; 71.3% male). Reliability analysis showed an internal consistency of $\alpha = .90$ for the entire RAS measure among the youth sample. Results of exploratory factor analysis identified the following four factors: personal determination, skills for recovery, self-control in recovery, and social support/moving beyond recovery among the substance-abusing youth sample. The RAS also demonstrated sound convergent and divergent validity in comparison to other validated measures of functioning, sobriety, and well-being. Collectively, results support that the RAS has adequate psychometric properties for measuring recovery among substance-abusing youth.

**Keywords** — psychometric testing, recovery, recovery assessment scale, substance abuse, youth

## INTRODUCTION

The recovery of substance abuse among youth, defined broadly as adolescents and young adults from age 10 to 25 (CDC 2010), is complex. In light of the chronic nature of substance use disorders, understanding the process of recovery and its complexities among youth populations has been a growing interest. Traditionally, recovery within the field of addiction (for both adults and youth) has been understood as a function of abstinence or relapse outcomes; however, outcome-based research with substance abuse populations has characterized recovery as a more complex process than just abstinence or relapse (Hser and Anglin 2011; Kaminer and Godley 2010; Substance Abuse Mental Health Services Administration-SAMHSA 2011).

Recent definitions of recovery have expanded to include other aspects of functioning and improvement. The Betty Ford Institute Consensus Panel (2007) has characterized the recovery concept as a lifestyle process encompassing not only sobriety, but also personal health and citizenship domains (Laudet and White 2008). SAMHSA (2011) has defined recovery more broadly,

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encompassing a subjective assessment of life in terms of the burden and impact of disease and treatment across physical and psychological functioning. Others have conceptualized recovery more as a function of strengths rather than pathologies (White and Cloud 2008) and as a process of stages or recovery paths (Groshkova, Best, and White 2013). Research among substance-abusing youth supports these latter views. For example, recent work by Gonzales et al. (2012a, 2012b, 2013) found that youth in substance abuse treatment tend to endorse recovery as a process of lifestyle change, asserting personal control to improve one's lifestyle using wellness-based approaches to getting healthy/healing, and having confidence in oneself to change.

The measurement of recovery within the field of mental health is more aligned with these latter views of recovery being a process of lifestyle improvement, well-being, and healing via self-management (Harding and Zahnheiser 1994; Wells, Hawkins, and Catalano 1988). A commonly used measure of recovery within the mental health field is the Recovery Assessment Scale (RAS) (Giffort et al. 1995). Research on the RAS has identified a five-factor structure measuring recovery as a process of lifestyle improvement, including: personal confidence and hope, willingness to ask for help, being goal and success oriented, reliance on others, and not being dominated by symptoms (Law et al. 2012; Corrigan et al. 1999, 2004). The RAS has been shown to have strong psychometric properties for internal consistency, test-retest reliability, and inter-rater reliability across several studies measuring recovery for populations suffering from mental health disorders (Salzer and Brusilovskiy 2014).

There is no current recovery measure that has been validated with substance-abusing youth. Given that the recovery of substance abuse among youth shares similarities with the RAS measurement of recovery, the current study explored the psychometric utility of the RAS for assessing recovery among a sample of substance-abusing youth who participated in a recovery support aftercare pilot project.

## METHOD

### Participants

The sample consisted of 80 substance-abusing youths who completed the RAS at admission to a recovery support aftercare pilot program called Project ESQYIR (Educating & Supporting inQuisitive Youth in Recovery). This aftercare program consisted of a randomized, controlled pilot trial investigating a mobile-based texting aftercare intervention compared to aftercare as usual standard practice for youth transitioning out of substance abuse treatment. Study inclusion criteria included youth (identifying as adolescent or young adult) in treatment for substance abuse, completing treatment for substance abuse, willing to comply to study procedures, and providing parental consent (if under 18). Study exclusion occurred if individuals exhibited severe medical and psychiatric impairment that warranted hospitalization or further specialty treatment.

### Procedures

Study procedures were approved by the Institutional Review Board (IRB) of Azusa Pacific University. Recruitment for Project ESQYIR occurred between January 2012 and July 2013 at community-based substance abuse treatment programs located in Los Angeles County, California. Research Associates (RAs) recruited youth using in-person advertisements during treatment groups and by leaving study information fliers with RA contact information with treatment staff. Youths who contacted the RA about study participation were screened for eligibility. Consent and baseline measures were administered upon completion from treatment.

### Measures

The Recovery Assessment Scale (RAS) is a 41-item scale that was developed to assess recovery outcomes from mental illness disorders (Corrigan et al. 1999) using Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) (see Online Supplement 1). Corrigan et al. (2004) found the RAS to have a five-factor structure in a sample of adults with a mental health diagnosis, consisting of only 24 out of the 41 items: (1) personal confidence and hope; (2) willingness to ask for help; (3) goal and success orientation; (4) reliance on others; and (5) no domination by symptoms to measure recovery (see Online Supplement 2 for specific items under each factor). The RAS was adapted for the pilot aftercare project such that the language related to mental illness was replaced to better reflect recovery from substance abuse. For example, a question such as "coping with my mental illness is no longer the main focus of my life" was changed to "coping with my alcohol/drug use is no longer the main focus of my life."

Other measures used for construct validation procedures included the Brief Addiction Monitor (BAM), a measure developed to monitor patient progress of recovery from substance abuse (Cacciolaa et al. 2013). The BAM includes substance use, risk, and protective dimensions. The substance use dimension includes items that measure continued alcohol and drug use; the risk factor dimension measures craving, sleep problems, mood issues, risky situations, and interpersonal problems; and the protective dimension measures aspects of self-help, spirituality, work, school, and income. Research has reported strong test-retest reliability for the BAM ($ICC = 0.7$) and excellent predictive validity for the substance use and risk factor dimensions (*Wald chi-square* $= 4.261$; $p < .05$; Cacciolaa et al. 2013). The Global Assessment Inventory of Needs-Short Screen (GAIN-SS) modified from the full GAIN (Dennis, Chan, and Funk 2006) was also used for construct validation. The GAIN-SS includes 20 items that measure behavioral health issues (internal mental distress,

behavioral complexity, substance use problem severity, and crime/violence). The total lifetime disorder scale of the GAIN-SS is used to screen for individual severity across all behavioral health issues. Research has validated the factor structure of the GAIN-SS, showing a satisfactory fitness index in terms of GFI (.87) and a good Root Mean Square Error of Approximation (.06) (Dennis, Chan, and Funk 2006). The total disorder scales (for past month and lifetime) have been shown to be highly correlated with the full GAIN scale ($r = 0.94$) (Dennis, Chan, and Funk 2006). Additionally, the Drug Abstinence Self-Efficacy scale (DASE), modified from the Alcohol Abstinence Self-Efficacy scale (AASE) (DiClemente, Fairhurst, and Piotrowski 1995; DiClemente et al. 1994), was used for construct validation. The DASE includes 20 items that assess individual self-efficacy/confidence of not using alcohol or drugs in high-risk relapse situations. The reliability estimates in terms of internal consistency for both the DASE and AASE have been shown to be excellent (Cronbach's alphas = .98 and .99, respectively). Research using binary logistic regression found that the prediction percentage between self-efficacy (measured by the DASE/AASE) and avoiding substance use was 66.1% (Chavarria et al. 2012). Lastly, the Short-Form (SF-12) measure, adapted from the SF-36 (Ware, Kosinski, and Gandek 2001), was used in construct validation. The SF-12 is designed to assess perceived health status (quality of life) in terms of physical and mental health functioning using 12 items that factor into two composite scales (Physical Composite Scale-PCS and Mental Composite Scale-MCS) (Gandhi et al. 2001). The SF-12 has been validated with mental health patients, with the PCS and MCS explaining 55% of the variance in the item responses (Salyers et al. 2000).

### Data Analysis

Initial analyses included reliability testing of the RAS measure to provide an overall estimate of internal consistency of the 41 items. We then used exploratory factor analysis (EFA) to determine the number of factors to be retained from the adapted RAS with the substance-abusing youths sample. An EFA with varimax (orthogonal) rotation was run using the Statistical Package for Social Sciences (SPSS), version 22.0, since it is believed that the latent factors embedded in the subscales are distinct constructs. Given that Mundfrom, Shaw, and Ke (2005) suggest that the minimum sample size needed to run EFA is 180, parallel analysis (PA) was performed using a syntax developed by O'Connor (2000) to compensate for the high variability of the small sample.

Although different criteria and methods have been used to identify the factor structure of a factor model (i.e., such as the Kaiser criterion (>1), the scree plot (inflection point), and PA), PA has been verified as the most accurate method (Velicer, Eaton, and Fava 2000; Glorfeld 1995;

Buja and Eyubuglu 1992; Hubbard and Allen 1987; Zwick and Velicer 1986; Humphreys and Montanelli 1975; Horn 1965). The logic of PA is similar to bootstrapping in resampling, such that the existing sample is regarded as a proxy population. The algorithm generates a set of random data correlation matrices by bootstrapping from the pseudo-population (resampling with replacement), and then the average eigenvalues and the ninety-fifth percentile eigenvalues are computed. The observed eigenvalues are then compared against the re-sampled eigenvalues. The decision criterion used is that the number of factors extracted should have eigenvalues greater than those in the random matrix (Yu et al. 2007). Using the ninety-fifth percentile of the resampled eigenvalues is equivalent to setting the alpha level to .05 in hypothesis testing (Cho, Li, and Bandalos 2009). Reliability analyses of the factors were performed. By convention, a Cronbach's alpha of more than 0.70 was used to determine the extent to which the scales are acceptable (Nunnally 1978).

Additional construct validation statistical procedures were utilized to examine convergent and discriminant validity of the RAS measure against other commonly used validated instruments that measure treatment outcomes among substance-abusing populations, described in the Measures section, including the BAM, GAIN-SS, DASE, and SF-12. All analyses are based on alpha level (two-tailed) set at $p < .05$ for statistical significance.

### RESULTS

### Participant Characteristics

Of the 80 substance-abusing participants, most were male (71.3%) and identified as Caucasian (42.5%), Hispanic (37.5%), Asian/Pacific Islander (8.8%), African American (10%), and Native American/Alaskan Indian (1.3%). The mean age was 20.47 (SD = 3.49) years. The majority were unemployed (63.7%) and 53.2% were currently enrolled in school (half or full time). Primary drugs in treatment included: marijuana (36.3%), methamphetamine (28.7%), cocaine (16.3%), heroin (11.3%), prescriptions drugs (5.0%), and alcohol (2.5%).

### Psychometric Analyses

Reliability analysis revealed a high internal consistency for the RAS as a whole ($\alpha = .90$). Figure 1 shows the results of the PA, which indicated that a four-factor structure was sufficient since the observed eigenvalue (2.38) was greater than the mean resampled eigenvalue (2.17) and the ninety-fifth percentile eigenvalue (2.29). Given these results, another EFA with varimax rotation and four-factor extraction was run. See online Supplement 3 for further detail on PA results.

Analyses from EFA resulted in a four-factor RAS structure. As shown in Table 1, Factor 1 ($\alpha = 0.86$), "Personal Determination," consists of 12 items that include

**FIGURE 1**
**Parallel analysis scree plot. This plot shows the results of the parallel analysis in which the line with the diamonds represents the original eigenvalues, the boxed line shows the mean eigenvalues of the resampling, and the triangle line represents the estimated eigenvalues at the ninety-fifth percentile**
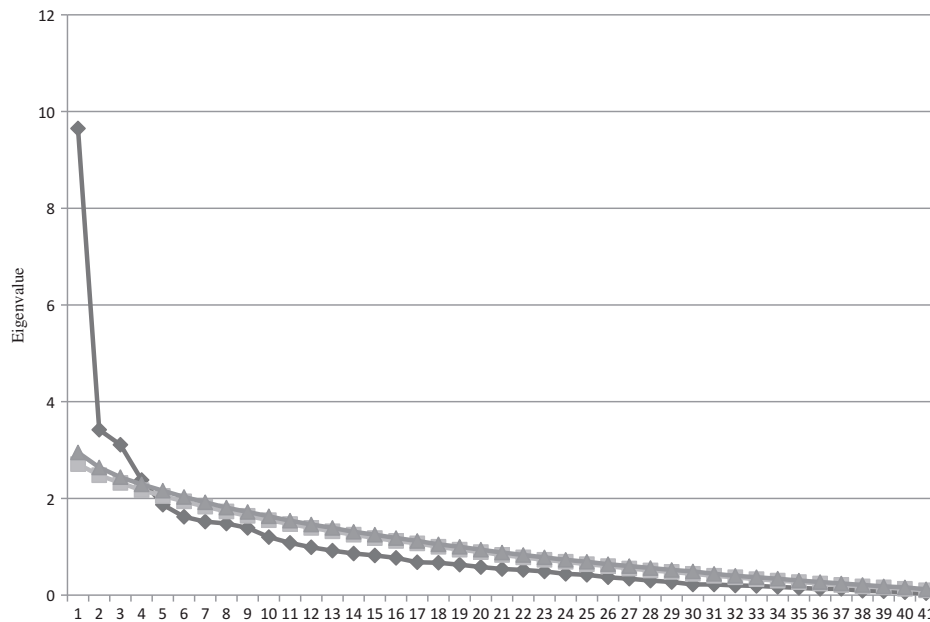


hopefulness about the future, desire to succeed, and purpose in life. Factor 2 ($\alpha = 0.80$) measures "Skills for Recovery" through agreement with seven statements such as willingness to ask for help and being able to identify triggers. Factor 3 ($\alpha = 0.83$), "Self-Control in Recovery," is composed of 10 items including having a plan to stay or become well, being able to handle stress, and understanding how to control one's alcohol or drug use. Factor 4 ($\alpha = 0.77$) measures "Social Support and Moving Beyond Recovery" through agreement with seven items that have to do with having people to count on and personal lifestyle change (i.e., having healthy habits).

We provide comparisons of the RAS factor structure for youth in recovery from the present study (i.e., four-factor structure, 36 out of 41 items) and the mental health sample by Corrigan et al. (2004) (i.e., five-factor structure consisting of 24 out of 41 items) in Table 2. As shown, items in Factor 1 of the four-factor RAS (Personal Determination) with substance-abusing youth corresponded well with items from both Factor 1 (Personal Confidence and Hope) and Factor 3 (Goal and Success Orientation) of the five-factor RAS. Items from Factor 2 (Willingness to Ask for Help) of the original five-factor RAS fit into Factor 2 of the four-structure RAS; however, it also included five additional items (not part of

the original three item factor) that had to do with skills for recovery (i.e., identifying triggers, early warning signs, knowing about services, etc.). Factor 3 of the four-factor RAS (Self Control in Recovery) corresponded well with Factor 5 of the original five-factor RAS (No Domination by Symptoms); however, it also included additional items beyond two of the original items) that were also specific to symptom improvement and self-control in recovery. Lastly, Factor 4 of the four-factor RAS (Social Support and Moving Beyond Recovery) corresponded well to Factor 4 of the original five-factor RAS (Reliance on Others); however, it also included additional items that measured relational aspects of recovery support and did not include certain items about friends (i.e., it is important to have a variety of friends).

In evaluating convergent validity of the four-factor RAS with other standardized measures in the field commonly used to measure recovery-related outcomes (i.e., BAM measures substance use and risk dimensions, DASE measures self-efficacy using a total score, GAIN-SS measures monthly and lifetime disorder status using total scores, and the SF-12 measures physical and mental functioning via the PCS and MCS total scores). Initially scatterplot and correlation matrices were used to observe inter-relationships. A high degree of positive correlation

**TABLE 1**
**Results from EFA of the RAS among substance-abusing youth in recovery**

|  | EFA[1] |
|---|---|
| Factor 1: Personal Determination ($\alpha = .855$) | |
| 01: I have a desire to succeed | .656 |
| 03: I have goals in life that I want to reach | .607 |
| 04: I believe I can meet my current personal goals | .594 |
| 05: I have a purpose in life | .623 |
| 15: I like myself | .541 |
| 16. If people really knew me they would like me | .357 |
| 17: I am a better person than before my experience with alcohol/drug use | .522 |
| 20: I have an idea of who I want to become | .553 |
| 21: Things happen for a reason | .626 |
| 22: Something good will eventually happen | .395 |
| 24: I'm hopeful about my future | .658 |
| 25: I continue to have new interests | .594 |
| | |
| Factor 2: Skills for Recovery ($\alpha = .802$) | |
| 09: I can identify what triggers my alcohol/drug use | .617 |
| 12: I know that there are alcohol/drug use services that do help me | .697 |
| 31: I am willing to ask for help | .323 |
| 32: I ask for help when I need it | .607 |
| 34: I know what helps me get better | .699 |
| 35: I can learn from my mistakes | .437 |
| 38: I can identify the early warning signs of becoming sick | .624 |
| | |
| Factor 3: Self-Control in Recovery ($\alpha = .833$) | |
| 02: I have my own plan for how to stay or become well | .426 |
| 07: I understand how to control my alcohol/drug use | .797 |
| 08: I can handle it if I get sick again | .821 |
| 10: I can help myself become better | .591 |
| 11: Fear doesn't stop me from living the way I want to | .511 |
| 14: I can handle what happens in my life | .509 |
| 18: Although my symptoms may get worse, I know I can handle it | .549 |
| 28: My symptoms interfere less and less with my life | .360 |
| 29: My symptoms seem to be a problem for shorter periods of time each time they occur | .374 |
| 36: I can handle stress | .373 |
| | |
| Factor 4: Social Support and Moving Beyond Recovery ($\alpha = .773$) | |
| 06: Even when I don't care about myself, other people do | .522 |
| 19: If I keep trying, I will continue to get better | .401 |
| 23: I am the person most responsible for my own improvement | .489 |
| 26: It is important to have fun | .498 |
| 37: I have people I can count on | .700 |
| 39: Even when I don't believe in myself, other people do | .709 |
| 41: It is important to have healthy habits | .391 |

*Note*. EFA = Exploratory Factor Analysis; RAS = Recovery Assessment Scale.
[1]Values in this column represent the factor loadings of each item generated by the EFA.

should be observed between measures of similar constructs, whereas in evaluating divergent validity no correlation or a high level of negative correlation should be found between measures of dissimilar constructs. When bivariate outliers were present, a density ellipse was superimposed on the scatterplot to cover 95% of the data. Overall, because

bivariate outliers were present in all pairwise relationships, robust fit was employed as a remedial tool. In addition, robust parameter estimates portray the direction of the relationship (positive or negative).

We display convergent analyses using robust fit and estimates of the RAS factor structure compared to other

**TABLE 2**
**Factor structure of the RAS among substance-abusing youth compared with mental health sample**

**4-Factor RAS substance abuse youth sample (N = 80)**

Factor 1: Personal Determination ($\alpha = 0.86$)
  1. I have a desire to succeed.
  3. I have goals I want to reach.
  4. I believe I can meet my current personal goals.
  5. I have a purpose in life.
15. I like myself.
16. If people really knew me they would like me.
17. I am a better person than before my experience with alcohol/drug use.
20. I have an idea of who I want to become.
21. Things happen for a reason.
22. Something good will eventually happen.
24. I'm hopeful about my future.
25. I continue to have new interests.

Factor 2: Skills for recovery ($\alpha = 0.80$)
  9. I can identify what triggers my alcohol/drug use.
12. I know that there are alcohol/drug use services that do help me.
31. I am willing to ask for help.
32. I ask for help, when I need it.
34. I know what helps me get better.
35. I can learn from my mistakes.
38. I can identify the early warning signs of becoming sick.

Factor 3: Self-control in recovery ($\alpha = .833$)
  2. I have my own plan for how to stay or become well.
  7. I understand how to control my alcohol/drug use.
  8. I can handle it if I get sick again.
10. I can help myself become better.
11. Fear doesn't stop me from living the way I want to.
14. I can handle what happens in my life.
18. Although my symptoms may get worse, I know I can handle it.
28. My symptoms interfere less and less with my life.
29. My symptoms seem to be a problem for shorter periods of time each time they occur.
36. I can handle stress.

Factor 4: Social Support and Moving Beyond Recovery ($\alpha = 0.77$)
  6. Even when I don't care about myself, other people do.
19. If I keep trying, I will continue to get better.
23. I am the person most responsible for my own improvement.
26. It is important to have fun.
37. I have people I can count on.
39. Even when I don't believe in myself, other people do.
41. It is important to have healthy habits.

**5-Factor RAS mental health sample (N = 1,750)**

Factor 1: Personal confidence and hope ($\alpha = 0.87$)
11. Fear doesn't stop me from living the way I want to.
14. I can handle what happens in my life.
15. I like myself.
16. If people really knew me, they would like me.
20. I have an idea of who I want to become.
22. Something good will eventually happen.
24. I am hopeful about my future.
25. I continue to have new interests.
36. I can handle stress.

Factor 3: Goal and success orientation ($\alpha = 0.82$)
  1. I have a desire to succeed.
  2. I have my own plan for how to stay or become well.
  3. I have goals in life that I want to reach.
  4. I believe I can meet my current personal goals.
  5. I have a purpose in life.

Factor 2: Willingness to ask for help ($\alpha = 0.84$)
30. I know when to ask for help.
31. I am willing to ask for help.
32. I ask for help when I need it.

Factor 5: No domination by symptoms ($\alpha = 0.74$)
27. Coping with mental illness is no longer the main focus of my life.
28. My symptoms interfere less and less with my life.
29. My symptoms seem to be a problem for shorter periods of time each time they occur.

Factor 4: Reliance on others ($\alpha = 0.74$)

  6. Even when I don't care about myself, other people do.
37. I have people I can count on.
39. Even when I don't believe in myself, other people do.
40. It is important to have a variety of friends.

**TABLE 3**
**Convergent analyses between measures using robust fit and estimates**

| Relationship | | Robust estimate | *P* | Validity |
|---|---|---|---|---|
| RAS Factor 1 & | BAM substance use factor | −0.025 | *0.053 | Divergent |
| RAS Factor 2 & | BAM substance use factor | −0.039 | *0.014 | Divergent |
| RAS Factor 3 & | BAM substance use factor | −0.044 | **0.009 | Divergent |
| RAS Factor 4 & | BAM substance use factor | −0.025 | *0.054 | Divergent |
| RAS Factor 1 & | BAM risk factor | −0.019 | **0.00048 | Divergent |
| RAS Factor 2 & | BAM risk factor | −0.014 | 0.064 | Divergent |
| RAS Factor 3 & | BAM risk factor | −0.013 | 0.081 | Divergent |
| RAS Factor 4 & | BAM risk factor | −0.009 | 0.192 | Divergent |
| RAS Factor 1 & | DASE Total Score | 0.014 | 0.118 | Divergent |
| RAS Factor 2 & | DASE Total Score | 0.022 | **0.008 | Convergent |
| RAS Factor 3 & | DASE Total Score | 0.025 | *0.035 | Convergent |
| RAS Factor 4 & | DASE Total Score | 0.004 | 0.351 | Divergent |
| RAS Factor 1 & | GAIN-SS total severity (month) | −0.04 | *0.018 | Divergent |
| RAS Factor 2 & | GAIN-SS total severity (month) | −0.039 | *0.017 | Divergent |
| RAS Factor 3 & | GAIN-SS total severity (month) | −0.071 | **0.00025 | Divergent |
| RAS Factor 4 & | GAIN-SS total severity (month) | −0.021 | 0.372 | Divergent |
| RAS Factor 1 & | GAIN-SS total severity (lifetime) | −0.011 | 0.496 | Divergent |
| RAS Factor 2 & | GAIN-SS total severity (lifetime) | −0.035 | *0.045 | Divergent |
| RAS Factor 3 & | GAIN-SS total severity (lifetime) | −0.057 | **0.00913 | Divergent |
| RAS Factor 4 & | GAIN-SS total severity (lifetime) | 0.014 | 0.361 | Divergent |
| RAS Factor 1 & | PCS-SF-12 | 0.017 | *0.035 | Convergent |
| RAS Factor 2 & | PCS-SF-12 | 0.004 | 0.61 | Divergent |
| RAS Factor 3 & | PCS-SF-12 | 0.012 | 0.392 | Divergent |
| RAS Factor 4 & | PCS-SF-12 | −0.002 | 0.86 | Divergent |
| RAS Factor 1 & | MCS-SF-12 | −0.025 | **0.00068 | Divergent |
| RAS Factor 2 & | MCS-SF-12 | −0.016 | *0.01054 | Divergent |
| RAS Factor 3 & | MCS-SF-12 | −0.024 | **0.00496 | Divergent |
| RAS Factor 4 & | MCS-SF-12 | −0.013 | 0.163 | Divergent |

*Significant at ≤ 0.05 alpha level. **Significant at ≤ 0.01 alpha level.

measures (BAM, GAIN, DASE, and SF-12) among the youth sample in Table 3.

## RAS and BAM Measures

All four RAS factors were negatively correlated with the BAM substance abuse domain (measuring substance use issues) ($p < .05$), showing that the RAS recovery factors and the BAM substance abuse domain are diverse constructs. However, results for the BAM risk domain (measuring problems of physical health, sleep, stress, mood, delusions, violent behavior, and cravings) with the RAS were not as clear-cut. Specifically, there were negative correlations between all of the RAS factors and the BAM risk domain; however, the association was only statistically significant for RAS factor 1 (personal determination).

## RAS and DASE Measures

The RAS factors that were positively correlated ($p < .05$) with the DASE self-efficacy total score included Skills for Recovery (Factor 2) and Self-Control in Recovery (Factor 3), showing that the RAS recovery factors and the DASE self-efficacy total score construct are convergent constructs. Results did not yield significant associations between the DASE self-efficacy total score construct and RAS recovery factors of Personal Determination (Factor 1) and Social Support (Factor 4).

## RAS and GAIN-SS Measures

Results showed negative correlations between all of the RAS factors and the GAIN total disorder scales (for both past month and lifetime use, $p < .05$), indicative that the RAS recovery factors and the GAIN total disorder construct are diverse constructs.

## RAS and SF-12 Measures

Results for the RAS factors and the quality of life (SF-12) physical (PCS) and mental (MCS) health measures were in the expected direction. Specifically, a higher score in perceived recovery was associated with a lower score in PCS (less perceived physical pain or hindrance) and a lower

score in MCS (less perceived mental impairment). These results were significant for the MCS construct with all of the RAS factors; however, for the PCS construct, only RAS factor 1 (personal determination) was significant ($p < .05$).

## DISCUSSION

There is growing interest in the substance abuse treatment field in understanding recovery and how to measure it as an outcome beyond abstinence/relapse (Laudet 2011) and more as a process (White 2007), including components of well-being (Best et al. 2012) and stages of lifestyle change/improvement (White 2007), which more adequately represent diverse sub-groups of substance abusers, like the youth population (Gonzale et al. 2012a). Given that research related to youth recovery show recovery to be more about improving one's behavioral lifestyle, asserting personal control, having confidence, maturity, discipline, and will power over one's life (e.g., Gonzales et al. 2012a, 2012b, 2013), we explored the psychometric properties of a recovery measure that taps into the latter definitions of recovery—using the RAS, which has been commonly used with mental health populations.

Results from the EFA and PA showed a four-factor RAS structure to adequately measure recovery outcomes among substance-abusing youth, including personal determination, skills for recovery, self-control in recovery, and social support/moving beyond recovery. Previous research on the RAS with mental health populations has identified the following five factors to measure recovery among mental health populations: personal confidence and hope, willingness to ask for help, being goal and success oriented, reliance on others, and not being dominated by symptoms (Corrigan et al. 1999, 2004; McNaught et al. 2007). Given that the idea of "recovery" has been put forward as a unifying concept among those suffering from substance abuse and mental disorders, results from this study, which used a measure of recovery from mental illness, reveal that the recovery concept has slightly different meaning for youths recovering from substance abuse.

As displayed in Table 2, the RAS four-factor recovery domains for the youth sample are comparable to the original five-factor structure (with a mental health sample), with slight variations across the domains. First, the original two categories of personal confidence/hope and goal/success combined into one factor for the youth sample, broadly labeled personal determination. Second, the original Factor 2 (willingness to ask for help) was important for youth in recovery; however, besides "getting help from others," other items that fit better for the youth included, for example, relying on self for improvement using "recovery skills" like identifying triggers, knowing the early warning signs for relapse, and knowing about services. Third, Factor 3 (Self-Control in Recovery) for the youth sample corresponded well with Factor 5 of the original five-factor RAS

(No Domination by Symptoms), both of which have to do with controlling symptoms; however, other items that were important for youths had to do with exerting personal control over symptoms for recovery improvement that were not included in the original factor. Fourth, Factor 4 (Social Support and Moving Beyond Recovery) for the youth sample corresponded well to Factor 4 of the original five-factor RAS (Reliance on Others); however, it also included items that had a personal focus of recovery and moving beyond recovery (i.e., "I am the person most responsible for my recovery" or "It is important to have healthy habits") that were not included in the original five-factor structure. Interestingly, the original structure of Factor 4 included the item "it is important to have a variety of friends," which was not important to youth (i.e., not part of the four-factor structure) of Factor 4. This is noteworthy, since youth in treatment are told to "stay away from old friends that may be negative for recovery."

As supported by convergence testing, the RAS four-factor model is psychometrically sound, hence it may be a valid measure of recovery for substance-abusing youth. Specifically, the RAS corresponded well to other standardized measures (BAM, GAIN-SS, SF-12, and DASE) that assess important domain areas related to "recovery" (i.e., measure areas of functioning and improvement) that are embedded under commonly used definitions of recovery, including sobriety, personal health/wellbeing, and citizenship.

With regards to the BAM and the RAS, results showed that the four RAS factors were negatively correlated with the BAM substance abuse domain. Participants endorsing the RAS measures would perceive themselves to be on the way to recovery (across the four domains), hence more able to stay away from substance abuse behaviors. Items of the RAS Factor 1 (personal determination) reflect having a desire to succeed and having purpose, which is opposite to the BAM risk domain (concerned with problems of physical health, sleep, stress, mood, delusions, violent behavior, and cravings). Hence, as individuals have positive feelings about themselves and their future, the problems with such risk factors should be reduced.

The convergence between DASE self-efficacy total score and Skills for Recovery (Factor 2) and Self-Control in Recovery (Factor 3) is logical since RAS Factors 2 and 3 and DASE self-efficacy total score measure personal aspects associated with controlling substance use behaviors. The uncorrelated DASE self-efficacy total score with Factor 1 and 4 is not surprising since these RAS factors measure broad aspects of how people perceive life in terms of recovery and social support for recovery rather than personal confidence in recovery.

The negative correlations between all of the RAS Factors and the GAIN total disorder scales are expected since participants who are in the process of recovery or working on changing their lifestyle should perceive fewer

symptoms across the GAIN behavioral health issues (internal mental distress, behavioral complexity, substance use problem severity, and crime/violence).

Results of convergent testing between the RAS four-factor structure and the SF-12 suggest that recovery from substance abuse is more about perceived mental health status than physical health since convergent results were only significant between the RAS and the mental health MCS, with only RAS Factor 1 significantly diverging from the PCS measure.

## Limitations

Caution should be taken when inferring the psychometric properties of the RAS, given the exploratory nature of the study. Since youths self-selected to participate in the aftercare study, the generalizability to other young people is limited. The small sample size also limits the results, and a larger sample would allow for confirmatory factor analysis and also for more sophisticated analyses (e.g., IRT's rating scale model). Additionally, the RAS data are based on self-report, which may be subject to over- or under-reporting. However, because the instrument was self-administered and filled out in private settings, the impact of self-report bias is reduced.

## CONCLUSIONS

Systematic attempts to understand and measure recovery among youth are lacking. Results from this study may be useful for the mental and behavioral health field as they support the current definitions of recovery being a personal-driven process, focused on lifestyle improvement (Best et al. 2012). Findings suggest that caution should be taken by treatment- and recovery-based aftercare programs alike when discussing recovery-goal-directed outcomes with youth (i.e., use of traditional-based recovery outcome rhetoric of abstinence and relapse vs. emphasizing recovery as a behavioral process). Further research, with larger samples, may investigate other psychometric properties of the measure, such as establishing cut-points and criterion-related validity.

## ACKNOWLEDGMENTS

## FUNDING

## SUPPLEMENTAL MATERIAL

Supplemental data for this article can be accessed on the publisher's website.

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