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## The 12 Step Affiliation and Practices Scale: Development and initial validation of a measure assessing 12 step affiliation

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### Abstract

**Objective**—Research on instruments designed to measure endorsement of 12 step beliefs and practices among individuals with substance use disorders is virtually nonexistent. The goal of this study was to examine the psychometric properties of a novel instrument called the 12 Step Affiliation and Practices Scale (TSAPS) using a sample of young adults receiving 12 step-based residential treatment for alcohol and drug dependence.

**Method**—As part of a naturalistic treatment outcome study, 300 young adults receiving residential treatment completed the TSAPS and several other assessments during and after treatment. Analyses of the TSAPS examined its factor structure, internal consistency, sensitivity to change over time, and convergent and predictive validity.

**Results**—A maximum likelihood estimation factor analysis using oblique rotation produced 4 factors accounting for 61.16% of the variance. Internal consistency was very high and scores on the TSAPS significantly increased across the course of treatment. Convergent validity was demonstrated by relationships with scales of treatment attitudes, twelve step expectancies and commitment to sobriety. Predictive validity was also found, as evidenced by a relationship between total TSAPS score at 3 months post-treatment and percent of abstinent days at 6 months post-treatment.

**Conclusions**—The TSAPS shows promise as a psychometrically sound, internally reliable measure of 12 step affiliation and practices among individuals with substance dependence.

### Keywords

12 step affiliation; psychometric; alcohol dependence

## 1. Introduction

Many alcohol and drug treatment programs incorporate the philosophy and plan of action outlined in the primary text of Alcoholics Anonymous. In its 2009 National Survey of Substance Use Treatment Services, SAMHSA found that 80% of treatment facilities report using Twelve Step Facilitation as a key component of their treatment model. In addition, many programs that do not use the 12 step model as the basis of treatment stress the importance of 12 step involvement and meeting attendance after treatment as a way to maintain sobriety and gains achieved in treatment (Office of Applied Studies, SAMHSA, 2009). A burgeoning research literature has consistently demonstrated that among

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adolescents and adults treated for alcohol and drug dependence, those who affiliate with 12 step fellowships have significantly better substance use outcomes following treatment than those who do not affiliate (see Kaskutas, Turk, Bond, & Weisner, 2003; Laffaye, McKellar, Ilgen & Moos, 2008). For these reasons, it is important to determine the extent to which individuals treated for alcohol and drug problems embrace the 12 step philosophy and actively practice the prescribed behaviors (including the 12 steps themselves) in their lives. Beyond utility for research purposes, a reliable and psychometrically validated 12 step involvement scale could assist treatment providers in identifying and intervening with patients who are not affiliating or following their aftercare recommendations.

Compared to adults with substance use disorders, less is known about the extent to which adolescents and young adults embrace and practice the 12 step philosophy. As demonstrated in several studies by Kelly and colleagues, regular meeting attendance is common among this age group, with half to two-thirds attending weekly in the immediate months following treatment (Kelly, Myers, & Brown, 2005; Kelly et al., 2008). Attendance is related to the age composition of the meeting attendees; adolescents are less likely to attend meetings consisting of older members (Kelly et al., 2005). Similar to adults, attendance drops across time, particularly after the 6-month mark (Kelly et al., 2008). Nonetheless, a number of studies suggest that youth who actively engage with 12 step fellowships experience more favorable outcomes after treatment and over the transition into young adulthood (Alford, Koehler & Leonard, 1991; Chi et al., 2009; Kelly et al., 2000; Kelly et al., 2010; Kelly et al., 2008; Kennedy & Minami, 1993;).

### 1.1 Existing measures of 12 step involvement

Several measures of 12 step involvement have been developed and psychometrically examined among adult samples. The Alcoholics Anonymous Affiliation Scale (AAAS; Humphreys, Kaskutas & Weisner 1998) contains several questions regarding frequency of 12 step meeting attendance as well as involvement in several other “prescribed” activities such as getting a sponsor, sponsoring others, reading AA literature and considering oneself to be a member of AA. The scale has high internal consistency and has been used with a wide variety of treated and untreated populations (Humphreys et al. 1998). Another commonly used measure is the Alcoholics Anonymous Involvement (AAI) scale and was developed using data from Project MATCH (Tonigan, Connors and Miller 1996). The content of this 13-item scale overlaps considerably with the AAAS and includes items focusing on meeting attendance, sponsorship, and reading AA literature. The scale has been found to have high internal consistency and test-retest reliability (Tonigan et al., 1996).

The two scales described above focus primarily on involvement with 12 step fellowships and capture meeting attendance and other prescribed behaviors that occur within the context of these fellowships (such as sponsorship and reading AA literature). Two other scales, the Addiction Treatment Attitudes Questionnaire (ATAQ; Morgenstern et al. 1996a) and the Twelve Step Expectancies Questionnaire (TSEQ; Kahler et al. 2006) focus on other aspects of 12 step involvement. In contrast to the affiliation scales, the ATAQ focuses on measuring patient *cognitions* rather than how often they are engaging in particular prescribed behaviors. The ATAQ measures endorsement of a number of 12 step cognitions and the extent to which these cognitions change across the course of treatment. These cognitions include a belief in personal powerlessness, the importance of a Higher Power, commitment to attending AA, and a belief that addiction is a disease that must be managed in the long term. The TSEQ is also a cognitive measure that assesses expectations specifically related to participation in 12 step fellowships. These expectations include: the extent to which attending meetings will have positive or negative emotional consequences, the extent to which attendance provides social support, and the extent to which attendance increases

motivation to remain sober (among others). Once assessed, these cognitions can be related to whether the patient is regularly attending these fellowships (see Kahler et al., 2006).

In summary, existing 12 step measures focus on a number of different areas, with some assessing the frequency of desired behaviors (such as meeting attendance and sponsorship) and others assessing 12 step related cognitions and expectancies. Two 12 step areas that are not well covered by these measures are the extent to which the person is actively practicing the 12 steps themselves and the extent to which the person endorses key beliefs inherent in the steps. We find this somewhat surprising, given that the 12 steps and the principles they represent form the foundation of the 12 step philosophy as outlined in the book of Alcoholics Anonymous (2001). For example, the belief in one's own personal powerlessness forms the basis of the first 3 steps and is specifically referenced in Step 1. The belief that a Higher Power is essential to one's recovery forms the basis of steps 2, 3, 6, 7, and 11, and the belief that self honesty is extremely important is captured in steps 4, 5, and 10. The belief that one needs to be of continual service to others is captured in Step 12 (Alcoholics Anonymous, 2001). Systematic measurement of both involvement with the steps themselves and endorsement of the beliefs underlying the steps will likely provide a more complete picture of 12 step involvement and how it relates to ongoing substance use.

Though several measures of 12 step involvement have been developed, only two of these measures attempt to measure detailed step involvement (i.e., working the steps) and endorsement of beliefs inherent in the steps. One measure is the Brown-Peterson Recovery Progress Inventory (B-PRPI), a 53-item scale constructed from extensive interviews with members of Alcoholics Anonymous who were asked to identify key characteristics and behaviors vital to their recovery. The items focus on behaviors across a wide variety of areas, such as attending meetings, reading literature, engaging in healthy exercise and diet, and improving relationships with others. Several of the items focus on the 12 steps themselves and include statements such as "I have completed the fourth step inventory" and "I have begun making amends". Brown and Peterson (1991) developed the scale and found it to have adequate split-half reliability and convergent validity, though to our knowledge no additional research on the scale has been published.

Gilbert (1991) developed and published the Steps Questionnaire, a 42-item assessment of an individual's beliefs and attitudes related to the first three steps. Example items are: "As an alcoholic, I cannot manage my own life", and "I cannot imagine sobriety without faith". Gilbert (1991) administered the questionnaire to a sample of 96 male veterans during treatment and at several points during the year following discharge. Factor analyses identified three factors representing the concepts of powerlessness, Higher Power, and surrender. Similar to the B-PRPI, the measure is available in the public domain but no additional research appears to have been published.

## **1.2 The Twelve Step Affiliation and Practices Scale (TSAPS) and goals of the present study**

Although several 12 step measures have been developed, only two measures focus specifically on step involvement (i.e., working each of the 12 steps) and endorsement of key beliefs underlying the steps. Neither of these measures has received much research attention, and the measure of step involvement (the Steps Questionnaire) only focuses on the first 3 steps. Because step involvement and endorsement of step-related beliefs form the foundation of the 12 step philosophy, there is great need for a concise, psychometrically sound instrument that assesses both. The primary objective of the present study was to examine the psychometric properties of a newly developed measure of 12 step involvement called the 12 step Affiliation and Practices Scale (TSAPS). The TSAPS assesses practice of all 12 steps and the extent to which an individual endorses key step-related beliefs.

The TSAPS was administered to a sample of young adults attending residential treatment as part of a larger study examining the effects of 12 step involvement on substance use outcomes during the year following treatment. The present analysis sought to examine the psychometric properties of the TSAPS using this young adult sample. Because much of the 12 step research on adolescents has generated findings similar to studies using adult samples, we conducted this study with the expectation that the findings could be generalized to adults as well.

In this study, 300 young adults attending residential alcohol/drug treatment completed the TSAPS at several different time points both during and after treatment. Analyses of the TSAPS focused on 3 objectives. A primary goal of 12 step facilitation treatment is to teach the 12 steps and help patients incorporate the steps into their lives as recovering individuals (Hayes et al., 2004). Ideally, patients will exhibit greater practice of the steps and higher endorsement of step-related beliefs at the end of treatment compared to before, and an instrument measuring these phenomena should be sensitive to this change. Therefore, the first objective was to examine the degree to which overall scores on the TSAPS increased across the course of treatment. The second objective was to examine the factor structure of the scale as well as the internal consistency of the overall scale and subscales. The third objective was to assess convergent validity by examining whether the TSAPS correlated with other measures pertaining to 12 step involvement. A final regression analysis addressed predictive validity and examined whether TSAPS scores at 3 months post-treatment predicted substance use outcomes at 6 months post-treatment.

## 2. Material and methods

### 2.1. Study population and protocol

The study sample was comprised of 300 young adults (aged 18–24) attending residential treatment for alcohol and drug dependence. The average age was 20.37 years ( $SD = 1.58$ ) with 55% aged 20 years or older. Seventy three percent were male and 95% were Caucasian. Length of stay averaged 25.29 days ( $SD = 6.15$ ) and 82% completed the treatment program and were discharged with staff approval. At treatment entry, 28% percent of participants reported alcohol as their primary substance of use, 27% reported marijuana and 21% reported opiates. Psychiatric symptom severity was assessed by the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2001). Mean scores on the anxiety and depression subscales of the BSI were 62.17 and 64.47 respectively, indicating a high degree of psychiatric severity. Regarding 12 step involvement prior to treatment, 61% of patients reported attending at least one 12 step meeting during the 90 days prior to treatment entry. The average number of meetings attended during this period was 11.20 ( $SD = 19.84$ ), with 10% of the sample attending 30 or more meetings. The study was conducted under the approval and oversight of Schulman Associates Institutional Review Board and all participants provided signed consent.

### 2.2. Measures

**2.2.1. The Twelve Step Affiliation and Practices Scale (TSAPS)**—The 21-item TSAPS assessed two aspects of 12 step involvement: the extent to which patients report practicing each of the 12 steps of the AA program, and the extent to which they endorse key beliefs related to the steps. Items assessing the practice of the steps covered all 12 steps and were worded similarly to the text of Alcoholics Anonymous (2001). Examples are “I make amends to those I have harmed”, “I practice the 12 steps in all my affairs”, and “I ask my Higher Power to remove my shortcomings”. Items assessing the endorsement of step-related beliefs included “I believe I am powerless over my alcoholism/and or drug addiction” (belief: personal powerlessness), “I believe in a power greater than myself” (belief:

importance of a Higher Power in recovery), “I am honest with myself and others” (belief: importance of self honesty), and “I attempt to help others even when it is inconvenient for me to do so” (belief: be of service). Several items on the TSAPS were adapted directly from items on the Steps Questionnaire (Gilbert, 1991) and Brown-Peterson Recovery Progress Inventory (1991). Other items were generated by licensed addictions counselors who were asked to identify core components of the 12 step philosophy. Each item was phrased as a statement and participants were asked to pick the response that “most closely reflects what you are doing, experiencing, or truly believe at this point in time”. The 5-point Likert response scale was as follows: 0 (“Never”), 1 (“Sometimes”), 2 (“Often”), 3 (“Very Often”), and 4 (“Daily”), with a total score of 84 possible. The twenty one items are shown in Table 1.

**2.2.2. The Addiction Treatment Attitudes Questionnaire**—The Addiction Treatment Attitudes Questionnaire (ATAQ; Morgenstern et al. 1996a) consists of 49 items designed to assess several different cognitions related to treatment, most of which are related to 12 step treatment specifically: Powerlessness, Higher Power, Disease Attribution, Abstinence-Violation effect, Commitment to AA/NA, and Identifying with others in Recovery. Two processes (Commitment to Abstinence and Intention to Avoid High Risk Situations) are related to treatment in general. Each process is represented as a subscale comprised of several items, all of which are answered on a 5 point Likert scale with anchors of 1 = “strongly disagree” and 5 = “strongly agree”. Higher scores represent higher endorsement of 12 step cognitions. The ATAQ has high internal consistency and adequate concurrent and predictive validity (Morgenstern et al., 1996a).

**2.2.3. The Twelve Step Expectancies Questionnaire**—The Twelve Step Expectancies Questionnaire (TSEQ; Kahler et al. 2006) measures expectations and beliefs related to participation in 12 step groups. The questionnaire is comprised of several different subscales related to 12 step group attendance, such as social support (“Going to AA/NA is a good way to meet “sober” friends), skill learning (“I could learn a lot by hearing about other people’s experiences in getting sober”), spirituality concerns (“I think that prayer or meditation could be very helpful in my recovery”) and increased motivation (“Going to AA/NA meetings would motivate me to stay sober”). Response options for each item range from 1 = strongly disagree to 6 = strongly agree. The TSEQ has high internal consistency and studies have demonstrated both concurrent and predictive validity (Kahler et al. 2006).

**2.2.4. Commitment to Sobriety Scale**—The Commitment to Sobriety Scale (CSS) was developed as an exploratory measure by co-author Kelly for use in this project. Seven of the 9 CCS items pertain to an individual’s willingness and motivation to stay sober, examples are: “staying sober is the most important thing in my life” and “I never want to use drugs or alcohol again”. The response scale ranges from strongly disagree = 1 to strongly agree = 6. Another item asks “how important is it for you to not drink or use drugs in the next 90 days” and has a scale ranging from 1 = not at all important to 10 = very important. The last item asks “how confident are you that you will be able to stay clean and sober in the next 90 days” and has a scale ranging from 1 = not at all confident to 10 = very confident. Responses to all items are summed together to create a total score, with higher scores representing a higher level of commitment to sobriety.

**2.2.5. The Brief Symptoms Inventory-18**—The BSI-18 (Derogatis, 2001) measures the severity of psychiatric symptoms related to depression, anxiety and somatization and has acceptable internal consistency and test-retest reliability. Higher scores denote a higher degree of symptom severity.



**2.2.6. Alcohol/Drug Self-Efficacy Scale (A-DSES)**—The Alcohol/Drug Self-Efficacy scale is a modified version of the Alcohol Abstinence Self-Efficacy scale developed by DiClemente et al. (1994). Items were slightly modified to refer to both drugs and alcohol. This scale presents 20 items describing different situations where a person may be tempted to drink or use drugs (e.g., “When I am very worried”, “When I am feeling a physical need or craving”) and for each item asks “How confident are you that you would not drink or use drugs in each situation” (0 = Not at all confident to 4 = Extremely confident). A parallel set of items asks “How tempted would you be to drink or use drugs in each situation” (0 = Not at all tempted to 4 = Extremely tempted). Items are summed together to create an overall score with higher scores denoting higher levels of self efficacy. The Alcohol Abstinence Self-Efficacy scale has high internal consistency and construct validity (DiClemente et al., 1994).

**2.2.7. Substance dependence diagnosis and substance use frequency**—Substance-related diagnoses and symptoms were measured with the Structured Clinical Interview for DSM-IV-TR (SCID; First, Spitzer, Gibbon and Williams, 2002). Alcohol and drug use were captured using a modified version of the Form 90 questionnaire (Project MATCH Research Group, 1993). The Form 90 has been used with both adolescents and adults with substance use disorders and has demonstrated validity and test-retest reliability (Tonigan, Miller and Brown, 1997). The modified Form 90 was administered shortly after treatment entry to capture substance use during the 90 days before treatment and was administered at 3 and 6 months after treatment discharge to capture posttreatment substance use. In the event individuals were not reached at the 3 month follow up, Form 90 items were modified to capture the entire 6 month period following discharge.

**2.2.8. 12 step involvement and meeting attendance**—At 3 and 6 months post-treatment participants were asked a number of questions regarding 12 step involvement, including how many meetings they had attended during the period and how many of the 12 steps they had “worked”. Four yes/no questions were taken from the Alcoholics Anonymous Affiliation Scale (AAAS; Humphreys et al. 1998) and referred to various 12 step experiences, such as considering oneself to be a member of AA/NA, having a sponsor, sponsoring someone else, and having a spiritual awakening. One other yes/no question asked whether the patient had celebrated a sobriety birthday. The number of yes responses to these questions was summed together to create a 12 step “composite” score ranging from 0 to 5.

### 2.3 Analysis strategy

The first analysis examined whether the total score on the TSAPS increased across the course of treatment. Ideally, as participants progress through 12 step-based treatment, they will begin to adopt many of the ideas and behaviors of the 12 step philosophy and will therefore show higher affiliation at the end of treatment compared to the beginning. A within-subjects analysis compared total TSAPS scores at 3 times: shortly after admission to treatment (baseline), roughly two weeks after admission to treatment (mid-treatment) and 2–3 days before discharge (end of treatment).

A maximum likelihood estimation (MLE) factor analysis was conducted to determine the factor structure of the TSAPS. We chose MLE rather than a principal components analysis because the latter technique is primarily a data reduction method and the goal was to explain the proportion of shared variance that was directly due to the latent factors. In other words, an MLE reveals any latent variables (i.e., factors) that cause the manifest variables to covary (see Costello & Osborne, 2005). Oblimin rotation was used because the factors were

correlated and once the factor structure was identified, Cronbach's alpha was obtained for each factor and the scale as a whole.

Another set of analyses sought to establish convergent validity by correlating the total TSAPS score with 3 conceptually related measures: the Addiction Treatment Attitudes Questionnaire (ATAQ; Morgenstern et al., 1996a) the Twelve Step Expectancies Questionnaire (TSEQ; Kahler et al., 2005) and the Commitment to Sobriety scale. A regression analysis was conducted to establish predictive validity and examined whether the total TSAPS score at 3 months post-treatment predicted substance use at 6 months post-treatment.

### 3. Results

#### 3.1 Change in TSAPS score across treatment

A one way repeated measures analysis of variance was conducted on the 256 patients who completed the TSAPS at baseline (2–3 days after admission to treatment), at the middle of treatment (roughly two weeks after admission) and at the end of treatment (2–3 days before discharge). The analysis revealed a significant increase in total TSAPS score over time,  $F(2, 510) = 100.10, p < .001$ . Scores at the end of treatment ( $M = 51.10; SD = 15.13$ ) were significantly higher than scores at both baseline ( $40.70; SD = 14.19$ ) and the middle of treatment ( $47.55; SD = 14.30$ ; all  $ps < .001$ ). It is important to note that at baseline, patients reported a fairly low level of affiliation, with a mean score that was less than half of the total score possible ( $40.70$  vs.  $84$ ). In addition, though the mean score at the end of treatment was significantly higher than at baseline, it was still considerably lower than the total score possible ( $51.10$  vs.  $84$ ), suggesting a moderate level of affiliation at the end of the treatment episode.

#### 3.2 Factor structure of the TSAPS

An exploratory factor analysis (EFA) was conducted on the 21 items of the baseline TSAPS using a maximum likelihood estimation procedure with direct oblimin (oblique) rotations. The Kaiser rule of choosing eigenvalues greater than 1 and the scree test were used to determine the number of factors to retain. The Kaiser rule indicated 4 factors accounting for 61% of the variance whereas the scree test suggested only 2 factors. Therefore, to determine the best factor solution, solutions between 2 and 5 were subjected to direct oblimin rotations and assessed for interpretability. The 4-factor solution was judged to be the most interpretable. To be considered part of a factor, an item had to have a cross loading of at least .30 with the factor and minimal cross loadings with other factors (Costello & Osborne, 2005). This solution accounted for 61% of the variance in the TSAPS items and correlations between factors ranged from  $-.44$  to  $.25$  (please see Table 2 for all correlations). The factors were named Relationship with Higher Power, Behavior Toward Others, Action Steps, and Honesty with Self and Others. Factor loadings were clean (see Table 1) with all but one of the 21 items loading on a factor. This item, "I believe I am powerless over my alcoholism and/or drug addiction" also had a substantially low communality (.10) and hence was removed. Each factor contained at least three loadings above .32, with the majority above .50 and no cross-loadings.

#### 3.3 Internal consistency

Cronbach's alpha for the 21 item TSAPS scale was .91, suggesting very high internal consistency (see Streiner & Norman, 2003). Cronbach's alpha was also computed for the four factors or subscales produced by the factor analysis. The Relationship with Higher Power subscale was the most reliable, with an alpha of .92; the Behavior Toward Others subscale had an alpha of .82. The Action Steps and Honesty with Self and Others subscales

had lower internal consistency (.72 and .78 respectively) but were still in the acceptable range.

### 3.4 Convergent validity analyses

To assess the convergent validity of the TSAPS, we ran Pearson's correlations between the total TSAPS score at baseline and 3 other measures pertaining to 12 step ideas and practices: the Addition Treatment Attitudes Questionnaire (ATAQ), the Twelve Step Expectancies Questionnaire (TSEQ), and the Commitment to Sobriety scale (CSS). Table 3 shows that as expected, the TSAPS correlated significantly and positively with scores on all 3 measures, with correlations ranging from .34 to .55.

### 3.5 Predictive validity analyses – regression of TSAPS at 3 months on percent days abstinent at 6 months

An important question is the extent to which scores on the TSAPS predict future substance use. Given the well established relationship between 12 step affiliation and substance use outcomes (Chi et al., 2009; Timko et al., 2006), we predicted that patients who scored high on the TSAPS during the first 3 months post discharge would have a higher number of abstinent days at 6 months post discharge than patients who scored low on the TSAPS. An ordinary least squares (OLS) multiple regression analysis was conducted with percent days abstinent (PDA) at 6 months as the criterion variable. PDA was the percentage of days in the 6 month follow up period that participants reported completely abstaining from alcohol and drugs. The total TSAPS score at 3 months was entered as a predictor, along with several other covariate variables related to PDA. These covariates were: PDA at baseline, the number of 12 step meetings attended at 3 months, additional substance use or mental health treatment during the follow up period (yes or no), and baseline scores on the ATAQ, CSS, and ADSES.

The regression model for PDA at 6 months was significant,  $F(8, 141) = 2.38, p < .05$  with an r-squared of .12 (see Table 4 for regression model statistics). The TSAPS score at 3 months was the only significant predictor (beta = .21,  $p = .02$ ). Higher scores on the TSAPS during the 3 month follow up period were associated with higher PDA during the 6 month follow up period. To account for the differences in pre-treatment 12 step affiliation and to address the possibility that pre-treatment affiliation may also predict treatment outcome, we reran the regression model for PDA at 6 months with the total TSAPS score at baseline entered as a covariate. The baseline TSAPS score did not emerge as a significant predictor of PDA in the model, nor did adding it change the original results (the TSAPS score at 3 months emerged as the only predictor).

## 4. Discussion

The 12 step affiliation and practices scale (TSAPS) was designed to assess the extent to which an individual is actively practicing the 12 steps outlined in the original text of Alcoholic Anonymous (2001). In addition, it measures the extent to which an individual endorses key beliefs that are embodied by the steps, such as belief in a Higher Power, the importance of self honesty, the importance of being of service to others, and a belief in personal powerlessness. The psychometric analyses reported here suggest that the TSAPS is sensitive to change, is significantly correlated with other 12 step measures, and is a significant predictor of later substance use.

Most current scales of 12 step affiliation are behaviorally-based and focus heavily on the frequency of discrete behaviors such as meeting attendance, obtaining a sponsor and reading 12 step literature. Though some measures focus on assessing 12 step-related cognitions,



most of these focus on cognitions specifically related to meeting attendance (e.g., the TSEQ; Kahler et al. 2006). An exception is the Addiction Treatment Attitudes Questionnaire (ATAQ; Morgenstern et al. 1996a), which asks about 12 step cognitions across a number of areas, such as belief in a Higher Power and the belief that addiction is a disease. However, the ATAQ was designed to assess cognitions specific to the treatment process itself and may not function optimally as a measure of 12 step related cognitions in general. In addition, none of the 12 step-related measures to date focus primarily on practice of the steps themselves, which form the basis of the program outlined in Alcoholics Anonymous (2001). In contrast, the TSAPS focuses in detail on the practice of the 12 steps and the extent to which individuals endorse key beliefs embodied by the steps (such as a belief in a Higher Power and the importance of self honesty). Because the steps and step-related beliefs form the core of the 12 step program and philosophy, use of this measure along with others could provide a more complete picture of 12 step involvement.

An exploratory factor analysis of the baseline TSAPS revealed a four factor structure accounting for over 60% of the variance. The first factor was a “Higher Power” factor and consisted of several items, some of which referenced specific steps relating to the Higher Power (e.g., I ask my Higher Power to remove my shortcomings). Other items comprising this factor outlined beliefs related to the Higher Power (e.g., I believe that I will progress in recovery with the help of my Higher Power). This factor denotes the importance of the Higher Power and the centrality of this concept within the 12 step program. The second factor was called “Behavior Toward Others” and consisted of items that reference behaviors that typify 12-step program values (e.g., I attempt to help others even when it is inconvenient for me to do so). The third factor was named “Action Steps” and consisted of items outlining steps that are not directly related to a Higher Power (e.g., I make amends to those I have harmed). The last factor was named “Honesty with self and others” and consisted of 3 items, all of which expressed the importance of honesty (e.g., “I express my feelings, talking honesty about my experiences with others”).

The factor structure identified above is consistent with the 12 step philosophy and program outlined in the book Alcoholics Anonymous (2001), in that it differentiates both the steps and step-related beliefs. It is also sensitive to the heterogeneity of the steps and spans several different domains, all of which are important to recovery. For example, several of the steps focus on the Higher Power specifically and all of these items comprised one factor in the present analyses. The remaining steps formed a separate factor. The factor structure also supports the importance of key step-related beliefs, such as being of service to others (captured in Factor 2) and the importance of being honest with self and others (Factor 4). It is also important to note that the factor analysis revealed moderate correlations among factors, indicating that while the factors were somewhat similar, each appears to be representing something unique from the others.

The value of the TSAPS may lie in its ability to simultaneously measure several distinct aspects of step-involvement. From a research perspective, it could be used as a measurement tool to quantify which elements of the 12 step program patients are currently practicing and endorsing. Once these different aspects of step involvement are measured, they can be correlated with other aspects of involvement (such as meeting attendance) as well as substance use outcomes. From a treatment and clinical care perspective, clinical staff could administer the TSAPS upon entry to 12 step treatment to measure whether the patient is practicing the steps and endorsing key beliefs, and a treatment plan could be designed to address underdeveloped areas. It could also be used to monitor ongoing step involvement after discharge from treatment and assess whether certain aspects of step involvement are more closely related to ongoing substance use than others. Finally, though causality cannot be determined from these results, the increase in total TSAPS score across treatment

suggests that many patients showed a significant increase in step involvement and endorsement of step-related beliefs as they progressed through 12 step-based treatment, suggesting the tool may be useful to measure treatment-induced change. However, at the end of treatment the total TSAPS score among this sample was much lower than the highest score possible (51 vs. 84), suggesting that some patients may not experience an increase in affiliation across the initial 25 days of residential treatment and certain patients may be more quick to affiliate than others. In addition, because patients in this study attended residential treatment, this short time frame may not have been long enough for them to reach later steps of the program (such as steps 8 and 9). Future research should assess the degree to which TSAPS scores change over longer periods of treatment exposure.

An issue for further study is the extent to which direct involvement with the steps (as measured by the TSAPS) predicts substance use outcomes above and beyond meeting attendance. Several studies have found both meeting attendance and other 12 step behaviors like sponsorship to be positively related to outcomes (Witbrodt & Kaskutas, 2005; Chi et al., 2009). The regression analysis in this study showed that when both meeting attendance and total TSAPS score at 3 months post-treatment were entered as predictors, only the TSAPS predicted the percentage of abstinent days (PDA) at 6 months. A follow up hierarchical regression showed that the number of 12 step meetings was significant when entered along with the covariates as the first step, but became insignificant when the TSAPS score was entered as the last step. This may have resulted from shared variance between the two variables (Pearson's  $r$  was .33) or perhaps the TSAPS score mediates the effect of meeting attendance on PDA. Future studies should continue to assess the relationship between meeting attendance and other aspects of 12 step affiliation and the role each plays in impacting treatment outcomes.

### Limitations

The present findings should be interpreted with caution for a number of reasons. The factor structure of the TSAPS produced by the exploratory factory analysis was not followed up with a confirmatory factory analysis. As such, findings should be considered preliminary until future studies replicate the results with other samples. Another methodological concern pertains to follow up rates. Roughly 30% of patients in the sample could not be reached at the 6 month follow up, which may impact the generalizability of the results. In addition, this study examined young adults who attended 12 Step based professional care grounded in the philosophy and practices outlined in the main text of Alcoholics Anonymous. It is unclear whether the results found here would generalize to older or younger samples of patients attending programs emphasizing other models of care. Lastly, though the TSAPS was piloted on a sample of young adults, it was not specifically created with this population in mind. It was included as a measure in a study focusing specifically on predictors of substance use outcomes among young adults attending residential treatment. Though we do not anticipate the measure would perform differently with adults, the present results should be considered preliminary until replicated with adult samples.

## 5. Conclusions

In summary, the present results suggest that the TSAPS may be a reliable, valid and psychometrically sound measure for assessing 12 step beliefs and practices among individuals with substance use disorders.

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**Table 1**

Direct oblimin rotated factor loadings for Twelve Step Affiliation and Practices scale (TSAPS) items

Item	Factor			
	1	2	3	4
I believe I am powerless over my alcoholism and/or drug addiction.	.191	-.141	.018	-.225
I believe in a power greater than myself.	<b>.799</b>	.069	.129	.067
I live as if I have turned my will and life over to the care of a Higher Power.	<b>.753</b>	.047	-.085	-.029
I am open and ready to have my Higher Power remove my defects of character.	<b>.857</b>	-.016	-.061	-.008
I ask my Higher Power to remove my shortcomings.	<b>.814</b>	.004	-.126	.011
I pray and meditate daily to improve my connection to my Higher Power.	<b>.626</b>	.143	-.232	.045
I believe that I will progress in recovery with the help of my Higher Power.	<b>.804</b>	.079	.082	-.069
I base my decisions in life on what will serve to deepen and preserve my inner "serenity" or peace.	<b>.391</b>	.162	-.243	-.175
When I realize I'm wrong, I promptly admit it.	.052	<b>.501</b>	-.134	-.044
I am honest with myself and others.	.077	<b>.682</b>	-.043	-.058
I attempt to help others even when it is inconvenient for me to do so.	-.041	<b>.426</b>	-.144	-.222
I attempt to forgive others when they offend or hurt me.	.032	<b>.518</b>	-.119	-.133
I treat other people as I would like to be treated.	.003	<b>.677</b>	.013	-.071
I resist the temptation to possess, control, or manipulate others.	.121	<b>.666</b>	.115	.031
I make amends to those I have harmed.	.057	.268	<b>-.322</b>	-.073
I perform a daily self-evaluation.	-.021	.090	<b>-.635</b>	-.023
I perform frequent "spot check inventories" during the day and night.	.046	-.104	<b>-.868</b>	.029
I practice the Twelve Steps in all of my affairs.	.274	.025	<b>-.353</b>	-.171
I am aware of what I need to change or work on for my ongoing recovery.	.037	.066	-.054	<b>-.577</b>
I share and discuss my blocks to recovery with others.	-.206	.179	-.093	<b>-.740</b>
I express my feelings, talking honestly about my experiences with others.	-.096	.276	.008	<b>-.632</b>

Note: Boldface values represent those variables with loadings above .32 on the factor and no cross-loadings above .32.



**Table 2**

Factor correlation matrix

	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>
Factor 1	1.00	.25	-.35	-.44
Factor 2	.25	1.00	-.41	-.42
Factor 3	-.35	-.41	1.00	.41
Factor 4	-.44	-.42	.41	1.00

**Table 3**

Pearson's correlations between total TSAPS score and other 12 step related measures at baseline

<b>Measure</b>	<b><i>r</i></b>	<b><i>p</i></b>
ATAQ total score	.42	.000
ATAQ – Higher Power	.55	.000
ATAQ – Commitment to AA	.34	.000
TSEQ total score	.41	.000
CSS total score	.34	.000

**Table 4**

Predictors of percent days abstinent (PDA) at 6 months posttreatment

Variables	SE	<i>t</i>	<i>p</i>	
Percent days abstinent (baseline)	0.07	.01	0.90	.37
ATAQ total score (baseline)	0.09	.02	0.95	.34
CSS total score (baseline)	0.14	.07	1.53	.13
ADSES total score (baseline)	-0.07	.03	-0.82	.41
# 12 step meetings (3 months posttreatment)	-0.02	.19	-0.16	.87
TSAPS total score (3 months posttreatment)	0.21	.03	2.34	.02*
Additional alcohol/drug treatment during 3 month follow up period	0.03	1.68	0.30	.77
Mental health treatment during 3 month follow up period	0.06	1.10	0.60	.55

\*  
 $p < .05$