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THE TWELVE PROMISES OF ALCOHOLICS ANONYMOUS: PSYCHOMETRIC MEASURE VALIDATION AND MEDIATIONAL TESTING AS A 12-STEP SPECIFIC MECHANISM OF BEHAVIOR CHANGE

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Abstract

Background—Empirical support for the recovery utility of 12-step mutual-help organizations (MHOs) has led to increased investigation of how such organizations confer benefit. The Twelve Promises of Alcoholics Anonymous (AA) feature prominently in 12-step philosophy and culture and are one of the few documented explications of the cognitive, affective, and behavioral benefits that members might accrue. This study investigated the psychometric properties of a measure of AA's Twelve Promises and examined whether it mediated the effect of 12-step participation on abstinence.

Method—Young adults (N=302, M age 20.4 [1.6], range 18–25; 27% female; 95% White) enrolled in an addiction treatment effectiveness study completed assessments at intake and 3-, 6-, and 12-months post treatment including a 26-item, Twelve Promises Scale (TPS). Factor analyses examined the TPS' psychometrics and lagged mediational analyses tested the TPS as a mechanism of behavior change.

Results—Robust principal axis factoring extraction with Varimax rotation revealed a 2-factor solution explaining 45–58% of the variance across three administrations (“Psychological Wellbeing” = 26–39%; “Freedom from Craving=17–21%); internal consistency was high (alpha = .83–.93). Both factors were found to increase in relation to greater 12-step participation, but significant mediation was found only for the Freedom from Craving factor explaining 21–34% of the effect of 12-step participation in increasing abstinence.

Conclusions—The TPS shows potential as a conceptually relevant, and psychometrically sound measure and may be useful in helping elucidate the extent to which the Twelve Promises emerge as an independent benefit of 12-step participation and/or explain SUD remission and recovery.

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Contributors Author Kelly designed the study and managed the literature searches and summaries of previous related work. Author Greene undertook the statistical analysis. Both authors contributed to and have approved the final paper.

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Keywords

Alcoholics Anonymous; 12-step; Twelve Promises; recovery; addiction; young adults

1. INTRODUCTION

For individuals seeking recovery from substance use disorder (SUD) achieving stable remission can take several years and typically involves multiple interventions and strong social support (Dennis et al., 2005; Kelly and White, 2011; Moos and Moos, 2006; Stout et al., 2012; White, 2010). A major additional contributing factor for many is participation in peer-led mutual-help organizations (MHOs), such as Alcoholics Anonymous (AA), Narcotics Anonymous, SMART Recovery, and myriad others (Humphreys, 2004; Kelly and Yeterian, 2008; Moos and Moos, 2004). In the United States, there are approximately 1.3 million active members of AA alone, meeting in around 57,000 weekly meetings. Its widespread reach and popularity is supported by systematic empirical research, which has found AA participation to facilitate abstinence and long-term recovery in a highly cost-effective manner (Ferri et al., 2006; Humphreys and Moos, 2001, 2007; Kaskutas, 2009; Kelly et al., 2006; Mundt et al., 2012; Tonigan et al., 1996)

As support for its effectiveness has increased, a growing body of research has begun to investigate how exactly 12-step MHOs like AA help individuals achieve and maintain long-term recovery from SUD (Kelly et al., 2009). Research has found that MHOs aid recovery through facilitating changes in social networks (Kaskutas et al., 2003; Kelly et al., 2010), increasing coping, motivation, and self-efficacy (Humphreys et al., 1999; Kelly et al., 2012, 2000; Morgenstern et al., 1997), and enhancing spirituality (Kelly et al., 2011a; Krentzman et al., 2013; Robinson et al., 2007; Zemore, 2007). From AA's own theoretical perspective on how recovery is purported to be achieved, however, research has been compromised, in part, because of challenges in construct conceptualization and measurement of AA-specific factors, such as spirituality.

The central proposed mechanism of recovery from addiction according to AA is through a "psychic change" (Alcoholics Anonymous, 2001, p. xxvi), "spiritual experience," or "spiritual awakening" (Alcoholics Anonymous, 2001, Appendix II), achieved through completion of the 12-step program (as noted in Step 12: "Having had a spiritual awakening as the result of these steps we tried to carry this message to other alcoholics and to practice these principles in all our affairs"). Although AA states that this "awakening" can take the form of a sudden and sometimes dramatic shift in belief and perspective, it also characterizes this transformation as a gradual change of an "educational variety" that leads to "... a profound alteration in [his] reaction to life" (Alcoholics Anonymous, 2001, Appendix II, pg 567). This is not only associated with belief in a potentially more traditionally defined, "higher power," but also involves concrete changes in specific attitudes and behaviors that result in recovery.

In the main AA text (Alcoholics Anonymous, 2001), AA states that as a result of beginning to work on the AA program, members will start to accrue twelve outcomes, or "promises," that describe rewarding shifts in quality of life that are likely to culminate from participation (Alcoholics Anonymous, 2001, p. 84–85). These "Twelve Promises" are often read out at the beginning or end of AA and other 12-step MHO meetings (Kelly and McCrady, 2008) and describe benefits, such as decreased cognitive-affective distress (e.g., freedom from craving/addiction; elimination of past regrets; decreases in fear of people and economic insecurity), as well as increases in psychological well-being (e.g., increased feelings of usefulness/meaning and purpose; increased intuition and gratitude). Thus, these Twelve

Promises may capture elements of what is commonly referred to as a “spiritual awakening” of the “educational variety.” Framed in this way, the attainment of the 12 Promises may play two important roles: first, as recovery benefits and ultimate outcomes in their own right; in fact, some may argue that these *are* “recovery”-adding quality of life beyond mere abstinence (Betty Ford Consensus Panel, 2008); and, second, as an intermediate outcome, or mechanism, through which members are spurred on to continued sobriety. In other words, 12-step MHO participation leads to these negative reinforcing benefits (e.g., freedom from craving, decreased affective distress) and positive reinforcing benefits (e.g., gratitude, meaning/purpose) captured in the Promises that make continued sobriety worthwhile. In plain language, “you go to AA, it helps you feel better, and you don’t drink.”

Consequently, the Twelve Promises are significant within the AA literature and broader 12-step MHO culture. While measures exist that capture some of the same broad elements encapsulated within the 12 promises, such as craving, distress, and psychological well-being (Sajatovic and Ramirez, 2012; Baer and Blais, 2009), the 12 promises have never been examined empirically, despite their prominence. Given the size and influence of 12-step MHOs, the extent to which the Promises become a reality for 12-step participants and whether the manifestation of these rewards in members’ lives is, to some degree, responsible for their recovery, is worthy of investigation. Consequently, to help fill these knowledge gaps, the current study had two main aims: 1. To construct and test the psychometric properties of a self-report measure derived from AA’s Twelve Promises; and, 2. To test its relation to 12-step participation and whether it mediates the effects of 12-step participation on abstinence outcomes. We examined the effects of both 12-step MHO attendance as well as active 12-step MHO involvement (e.g., having a sponsor, verbally participating during meetings, reading 12-step literature outside of meetings) with the prediction that active involvement would have a stronger relationship to increases in the Twelve Promises.

2. METHOD

2.1 Participants

Participants were 302 young adults (18–24 years old) undergoing residential treatment and enrolled in a naturalistic study of treatment process and outcome. At admission, participants were 20.4 years old on average ($SD = 1.6$), primarily Caucasian (94.7%), male (73.8%) and single (100.0%). At admission, 11.9% were employed full-time and 41.1% were enrolled in school (high school or college). Most had completed high school: 43.4% had a high school diploma and 39.8% had some college education. The most commonly reported “drug of choice” was alcohol (28.1%) and marijuana (28.1%), followed by heroin or other opiates (22.2%), cocaine or crack (12.3%), and amphetamines (6.0%). Small proportions reported benzodiazepines (2.0%), hallucinogens (1.0%), or ecstasy (1.0%) as their drug of choice (a small number of participants ($n=5$) reported more than one drug of choice, such that these proportions do not sum to 100%).

Participants in this private treatment sample were more likely to be Caucasian than young adults (18–24 years old) in public sector residential treatment (76%; Substance Abuse and Mental Health Services Administration, 2009), or adults (18+ years old) in the broader private treatment sector (71%; Roman and Johnson, 2004). They were, however, comparable in terms of gender, marital status, and employment status, suggesting that results are broadly generalizable to youth treated for substance-related disorders in the US.

2.2 Treatment

Treatment was comprehensive and multi-faceted, based in a 12-step philosophy of recovery. In addition to the 12-step orientation, motivational enhancement and cognitive-behavioral therapeutic approaches, as well as family therapy, were used to facilitate problem

recognition, treatment engagement and support recovery. Programming included clinical assessment, individual and group therapy, and a host of specialty groups tailored to meet the needs of individual clients. Participants' average length of stay at the residential treatment center was 25.5 days ($SD = 5.7$). The majority (83.8%) were discharged with staff approval, indicating a high rate of treatment completion.

2.3 Procedure

Participants were enrolled in the study shortly after admission. A total of 607 young adults were admitted to treatment during the recruitment period (October, 2006 to March, 2008). All of those aged 21–24 years old were approached for study enrollment, as well as every second individual aged 18–20, in order to ensure sufficient representation of the older age group. A small number of potential participants left treatment before recruitment could take place ($n = 6$) or were not approached by staff for recruitment ($n = 14$). Of those approached ($n = 384$), 64 declined or withdrew participation. Reasons for non-participation included not wanting to participate in the follow-up interviews (44%), not being interested in the study (31%), wanting to focus on treatment (14%), and legal issues (2%). Following enrollment, an additional 17 participants withdrew prior to the baseline assessment and the consent for one participant was misplaced. The final sample of 302 represents 78.6% of those approached for participation.

Research staff conducted assessments at baseline, end of treatment, and 3-, 6-, and 12-months post-discharge. Each assessment included an interview portion and self-administered surveys. Participants were compensated for their participation. Assessment completion rates were 87.1% at end of treatment, 81.8% at 3-month follow-up, 74.3% at 6-month follow-up, and 71.3% at 12-month follow-up.

At each time point, those who did not complete the assessment were compared to those who were retained in terms of demographics, baseline psychological symptoms, dependence severity and percent days abstinent (from all substances except nicotine) in the 90 days prior to treatment. Relative to those with post-secondary education, those with a high school education or less were more likely to be missed at all time points, both in-treatment and post-treatment. Consequently, education was retained in analytic models to control for this. The study was conducted in accordance with the Institutional Review Board at Schulmann Associates IRB, an independent review board, and all participants signed informed consent documents.

2.4 Measures

2.4.1 Demographics and covariates—Background sociodemographic information, including age, gender, marital status, race, ethnicity, employment and education was obtained, with full permission, from the medical record. Commitment to sobriety and self-efficacy were captured using the Commitment to Sobriety Scale (CSS) and a single-item measure of self-efficacy. Commitment to sobriety and self-efficacy have been previously validated in this sample (Kelly and Greene, in press; Hoeppner et al., 2011). The internal consistency of the commitment to sobriety scale at baseline was high ($\alpha = 0.89$; Kelly and Greene, in press) and both measures have produced superior criterion validity compared to other measurement tools examining similar constructs (e.g., ATAQ, A-DSES).

2.4.2 Alcohol and other drug use—The Form-90 (Miller and Del Boca, 1994; Project MATCH Research Group, 1993) is an interview-based measure capturing substance use, use of psychiatric medications, criminal justice system and treatment involvement, and consequences related to work or school. The recall period for the baseline interviews was 90 days. Primary outcome measures derived from this instrument included percentage of days

abstinent (PDA) from all substances (except nicotine), and percentage of days of heavy drinking (PDHD), defined as six or more drinks on one day. The Form-90 has been tested with adult and adolescent samples and has demonstrated test-retest reliability and validity (Slesnick and Tonigan, 2004; Tonigan et al., 1997). Saliva tests were administered to a subsample to verify self-reported abstinence (Cone et al., 2002). Abstinence was confirmed in 94.5% to 100% of subjects who self-reported abstinence from all substances during the assessment period prior to each follow-up. Positive tests results were obtained for 3 subjects who reported abstinence prior to the 1-month follow-up, and 1 subject prior to the 3-month follow-up.

2.4.3 Twelve-step participation—Twelve-step attendance and active 12-step involvement was measured at each assessment time point using the Multidimensional Mutual-help Meeting Activity Scale (Kelly et al., 2011b). This provided in-depth information across two dimensions of participation: (i) meeting attendance; (ii) active fellowship involvement. Active 12-step involvement was a summary index based on the sum of 8 dichotomous indicators (yes/no): consider yourself a 12-step member, have a 12-step sponsor, contact with sponsor outside of meetings, contact with other members outside of meetings, read 12-step literature outside of meetings, talk during meetings, help set up or run meetings, and completed step work. Internal consistency of the composite measure was high (Kuder-Richardson Formula 20: 3 months=0.88, 6 months=0.88, 12 months=0.95).

2.4.4 Twelve Promises Scale (TPS)—The TPS was constructed for the current study. Items were generated by the first author in consultation with a number of clinicians working in 12-step oriented treatment facilities as well as members of AA and NA with varying lengths of sobriety. The result was a 26-item self-report measure designed to capture the essence and elements of AA's original Twelve Promises (Alcoholics Anonymous, 2001). The 26 items generated from the original Promises were produced intentionally in such a way so as not to trigger an obvious connection to the original list. This was done to prevent acquiescent responding and potential over endorsement of the Promises that we anticipated might occur because of prior frequent exposure to them during treatment or at 12-step meetings. We believe the resulting 26-item measure could be seen to be objectively independent and unrelated to the Promises, but simultaneously, able to successfully capture their essence. The Promises are purported to describe the adaptive attitudinal, cognitive-affective, and behavioral changes that are expected to accrue as a consequence of 12-step MHO participation. The items are rated according to how true they are currently for respondents, from *never true* (1) to *true most of the time* (5). Three items were reversed scored (see Table 1).

2.5 Analysis Plan

We first examined the measures of central tendency and dispersion for the TPS, related 12-step (e.g., attendance and involvement) and treatment variables at each time point followed by exploratory factor analyses of TPS. Factor structure and internal consistency measures were examined across time points to assess factorial invariance. Factors were extracted using principal axis factoring and orthogonally rotated using a Varimax rotation. Considering the slight variation between factors at each administration (3-, 6- and 12-month), we assembled the final factors by including items that loaded most highly on the respective factor(s) at 2 or more administrations. We then computed Spearman rank order correlations to examine the bivariate relationships among the incipient TPS factors and the other variables of interest (e.g., 12-step attendance, 12-step involvement and PDA).

Prior to conducting the mediation analyses, given significant skewness, we transformed the dependent variable, PDA, using a negative log transformation. To avoid temporal

confounding among the independent variables (12-step attendance and 12-step involvement), the mediator (TPS), and the outcome variable (PDA), we employed a lagged and a partially lagged mediational design (Figure 1). The fully lagged model examined 12-step attendance and involvement from 1–3 months post-treatment, the TPS mediator 4–6 months post-treatment, and PDA 6–12 months post-treatment. The partially lagged model examined 12-step attendance and involvement from 4–6 months post-treatment, mediators 6–12 months post-treatment and PDA 6–12 months post-treatment. This partially lagged model was investigated because we wanted to assess for any potential differential effects among variables later in the course of recovery given that the Twelve Promises are deemed to take a while to accrue typically following substantial participation in 12-step MHOs (Alcoholics Anonymous, 2001, p. 84). It would have been more ideal had there been a subsequent follow-up for PDA (i.e., 15 month) as this would have allowed for a fully lagged second model that was later in time following treatment.

To help rule out causes of change in the mediators and outcomes beyond the effects of 12-step attendance and involvement, we controlled for other independent predictors of PDA (age, self-efficacy and commitment to sobriety), predictors of attrition (education), treatment related variables associated with PDA, and baseline levels of the outcome and mediator variables. We used the standard conceptual mediational framework developed initially by Baron and Kenny (1986) to test for mediation and the indirect effect of TPS between 12-step attendance/involvement and substance use outcomes (PDA) (Baron and Kenny, 1986; Kenny et al., 1998). We calculated standardized beta coefficients (β) in order to allow for comparability between parameters and models with respect to the magnitude of the effects. To statistically assess mediation, the Sobel statistic was calculated to quantify the mediational effect of the TPS subscale on the predictor-outcome relationship. In addition, we calculated the percent of the total effect that was mediated by the TPS subscale and the ratio of the indirect to the direct effect. All analyses were generated using SAS Version 9.2 (SAS Institute Inc., Cary, NC).

3. RESULTS

3.1 12-Step and Treatment Participation

The proportion of the sample attending 12-step MHOs at treatment intake, and at 3-, 6, and 12-month follows was 35%, 87%, 81%, and 76%, respectively. At 3-months, the sample reported attending 12-step groups an average of 49.7% of days ($M=49.7$, $SD=35.8$) during the follow-up period and reported fulfilling approximately 6 ($M=5.67$, $SD=2.57$) of the 8 involvement indices (see table 2). Approximately 75.9% ($n=186$) of the sample received additional substance use treatment during the follow-up period. At 6-months, attendance dropped to approximately 39.4% of days ($M=39.4$, $SD=33.1$), and involvement dropped slightly to an average of 5 ($M=5.30$, $SD=2.96$) of the 8 involvement indices. The number of participants receiving additional SUD treatment dropped to 58.4% ($n=129$) at the 6-month follow-up. Further details on 12-step participation in this sample may be found elsewhere (Kelly et al, 2011a, 2013).

3.2 Promises factor structure and internal consistency

The principal axis factoring extraction yielded two interpretable factors that were consistent across three administrations accounting for 57.3%, 44.8%, and 47.0% of the variance at 3-, 6-, and 12-months respectively (Table 1). Factor labels were determined based on the item content and consequently were denoted as *Psychological Wellbeing* (factor 1) and *Freedom from Craving* (factor 2). Psychological Wellbeing consisted of thirteen items derived from eight of the Twelve Promises (see Table 1). The internal consistency for Psychological Wellbeing was very high, ranging from $\alpha=0.91$ at 3-months to $\alpha=0.93$ at 12-months.

Freedom from Craving consisted of three items derived from one of the 12-step promises. The internal consistency of freedom from craving was comparably high, ranging from $\alpha=0.83$ at 3-months to $\alpha=0.92$ at 12-months. The internal consistency did not appreciably change when any one item was removed for either factor.

3.3 Bivariate relationships between variables of interest

Spearman rank order correlations revealed significant bivariate associations between 12-step attendance, 12-step involvement, psychological wellbeing, freedom from craving and PDA (Table 2). Attendance and involvement were positively associated with PDA contemporaneously and prospectively ($p<.001$). Increased attendance and involvement at any time point appeared to be most strongly associated with greater Psychological Wellbeing and Freedom from Craving at 12-months, with one exception: involvement at 3-months was most strongly correlated with Psychological Wellbeing at 3 months, a relationship that attenuated at both subsequent time points. Greater levels of Psychological Wellbeing and Freedom from Craving were most strongly associated with higher PDA concurrently at each administration respectively.

3.4 Mediation Effects on PDA

Prior to mediational analyses, we examined the overall direct effect of 12-step attendance/involvement on PDA. As hypothesized, greater levels of attendance and involvement 4–6 months post-treatment were significantly associated with higher PDA ($p<0.01$), controlling for predictors of attrition, treatment-related and other predictors of PDA and baseline levels of PDA (Table 3). Conversely, levels of attendance and involvement 1–3 months post-treatment were not significantly associated with PDA at 12 months. In the multivariate regression frameworks, attendance was only associated with Psychological Wellbeing ($\beta=5.592$, $p=0.016$) and Freedom from Craving ($\beta=2.505$, $p=0.004$) in the partially lagged models while involvement was never associated with these TPS subscales. In regression models containing both the respective independent variable (attendance/involvement) and PDA regressed on the mediator, Freedom from Craving persisted as a significant predictor of greater PDA in both the lagged and partially lagged models ($p<0.05$). When controlling for attendance or involvement, Psychological Wellbeing only, emerged as a significant predictor of PDA in the partially lagged models when controlling for 6-month involvement ($\beta=0.030$, $p=0.031$, Table 3).

When considered together, the parameter estimates produced by these models provide some evidence of mediation when tested formally using the mediational approach and the Sobel product of coefficients test. Results from the partially lagged mediation model demonstrated that Freedom from Craving explained 33.57% of the direct effect of 12-step MHO attendance on PDA ($t=2.65$, $p=0.008$). There was some additional evidence for mediation with respect to Freedom from Craving in the fully lagged models, which explained 21.17% of the effect of involvement on subsequent PDA; this did not reach the conventional $p<.05$ criterion for significance, however (observed $p=.075$). Psychological Wellbeing, in contrast, was not found to mediate either attendance or involvement on PDA in either the fully or partially lagged models (Table 4).

4. DISCUSSION

This is the first empirical study to examine a measure of AA's Twelve Promises and test their ability to explain recovery benefits related to 12-step MHO participation. Consistent support across scale administrations was found for two extracted factors subsequently entitled, "Psychological Wellbeing" and "Freedom from Craving," based on a face valid analysis of item factor loadings. The two sub-scales showed stability across follow-up

assessments and possessed high internal consistency. Furthermore, controlling for confounds, consistent with AA's original theory, both were found to increase to some degree in relation to greater 12-step participation. Mediation testing, however, found that only Freedom from Craving, and not Psychological Wellbeing, helped explain the effect of 12-step attendance on later abstinence. Findings add important new information to the limited body of evidence in mechanisms research examining 12-step mediators of behavior change (Kelly et al, 2009); consequently, findings have implications for AA theory and in understanding how AA and similar 12-step organizations may confer benefit and aid addiction recovery.

4.1 12-step Attendance and Involvement in relation to TPS subscales

The TPS Psychological Wellbeing subscale was found to increase significantly in relation to greater 12-step attendance in the partially, but not fully, lagged model. The partially lagged model measured the Promises at 12-month follow-up as opposed to the 6-month follow-up in the fully lagged model. As alluded to earlier, the emergence of the significant relationship at the later follow-up may be because it takes a longer duration of participation in 12-step MHOs before members begin to accrue more of these positive psychological and emotional benefits. Concretely, in the AA main text (Alcoholics Anonymous, 2001), the Twelve Promises are surmised to emerge only after completing the first nine of the 12-steps, implying a considerable duration of involvement. In future research we plan to examine the TPS at later follow-up points to help determine whether these begin to accrue following longer 12-step tenure. Contrary to predictions, attendance was related to greater Psychological Wellbeing but greater 12-step *involvement* was not. This was surprising since more active participation in terms of having and using a sponsor, working the 12-steps, reading 12-step literature, and verbally participating during meetings, in theory, might be expected to accelerate accrual of these benefits. It may be the case, however, that the Promises are more a function of extensity rather than intensity of participation or, at least, need some time to emerge. Again, however, we think it prudent to examine these relationships over longer periods of time to help support or refute this notion.

Similarly, the Freedom from Craving subscale was found to increase significantly in relation to greater 12-step attendance in the partially lagged, but not the fully lagged model, and again, involvement was not related to greater Freedom from Craving.

4.2. Mediational properties of the TPS

In terms of successfully meeting all significant paths that are necessary for the support of a mediational effect, this was found only for the Freedom from Craving subscale. Support was found for this subscale as a significant mediator of the effect of 12-step attendance in the partially lagged model, and came close to evincing a significant mediational effect for involvement in the partially lagged model ($p=.075$). Noteworthy, too, was the amount of the direct effect that was explained by this factor; this ranged from 21.17% for involvement and 33.57% for attendance in the partially lagged models. Overall, this pattern of findings suggests that one of the ways that 12-step participation aids addiction recovery in the year following treatment is by successfully reducing members' urges, thoughts, cravings, and compulsions to use alcohol or other drugs and, to the extent that the subscale items accurately capture the intention of AA's original Twelve Promises, is consistent with AA's own documented experience regarding how individuals might benefit from 12-step participation and, in turn, achieve remission and recovery.

4.3. Limitations

Generalizations from the current study should be made with caution in light of certain limitations. As noted in the measures section of the method, the TPS items were generated

not to be an obvious representation of AA's original Twelve Promises. In so doing, however, it is possible that we may have missed important nuances captured in the language of the Promises themselves. Sample characteristics should also be considered. Patients were severely substance involved and from a single 12-step oriented, private residential facility. In addition, the demographic nature of the sample (i.e., young adult, mostly male and White) should be considered also when extrapolating from findings. Also, although predictors of study attrition were assessed and controlled for when significant, there was considerable attrition especially at the 12-month follow-up. Confidence is bolstered, however, by the consistency in the pattern of relationships among study variables across time, but future replications are needed to determine the empirical robustness of our findings.

4.4. Conclusions

The Twelve Promises of AA and related 12-step organizations are a prominent aspect of 12-step philosophy and culture and, in addition to abstinence, are one of the few documented explications of the distinct cognitive, affective, and behavioral benefits that 12-step members might accrue as a function of participation. This study found support for a measure of the Twelve Promises, a subscale from which, was found to successfully mediate the effect of 12-step participation on later outcome. The TPS may serve as a useful measure in future longer-term longitudinal investigations to help elucidate the extent to which the Twelve Promises emerge for 12-step members over time, as an independent benefit of participation and/or as a mediator of SUD remission and recovery.

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Figure 1.

Path diagram of the meditational model

*Fully lagged model: Attendance/Involvement (1–3 months), Promises (3–6 months) and PDA (6–12 months)

**Partially lagged model: Attendance/Involvement (4–6 months), Promises (6–12 months) and PDA (6–12 months)

Table 1

Individual Promises item loadings and internal consistencies across follow-up time points.

12-Step Promise	Item	Factor 1: Psychological Wellbeing [*]			Factor 2: Freedom From Craving ^{**}		
		3 Month	6 Month	12 Month	3 Month	6 Month	12 Month
1. <i>We are going to know a new freedom and a new happiness.</i>	1. I feel happy [*]	0.542	0.500	0.259	0.248	0.236	0.261
	19. I don't feel that compulsion to drink or use drugs the way I used to ^{**}	0.245	0.247	0.279	0.614	0.645	0.810
	20. I don't worry as much that I'm going to have a slip or a relapse ^{**}	0.251	0.182	0.200	0.671	0.698	0.771
	21. I am not so obsessed with thinking about using or not using alcohol/drugs ^{**}	0.208	0.326	0.226	0.841	0.755	0.831
2. <i>We will not regret the past nor wish to shut the door on it.</i>	7. I do not particularly wish to forget my past	0.240	0.408	0.267	0.002	0.178	0.216
	10. I do not regret what has happened in the past [*]	0.421	0.513	0.135	0.028	0.103	0.076
3. <i>We will comprehend the word serenity.</i>	3. I feel grateful for what I have [*]	0.341	0.455	0.415	0.186	0.195	0.188
	9. I experience times when I have real peace of mind [*]	0.631	0.656	0.308	0.232	0.222	0.345
	22. I believe things are going to work out okay [*]	0.574	0.361	0.624	0.209	0.327	0.268
4. <i>We will know peace.</i>	2. I worry a lot [†]	0.300	0.324	0.147	0.097	0.133	0.086
5. <i>No matter how far down the scale we have gone, we will see how our experience can benefit others.</i>	4. I feel my personal experience can be of help to other people [*]	0.600	0.629	0.373	0.130	0.178	-0.010
	26. I believe I have something to offer other people [*]	0.657	0.555	0.411	0.145	0.281	0.195
6. <i>That feeling of uselessness and self-pity will disappear.</i>	6. I feel sorry for myself [†]	0.035	0.114	0.175	-0.022	0.105	0.180
	8. I feel useful [*]	0.731	0.651	0.362	0.151	0.178	0.186
7. <i>We will lose interest in selfish things and gain interest in our fellows.</i>	11. Nowadays, I am more interested in other people and what they're doing	0.247	0.340	0.060	0.030	0.076	0.185
8. <i>Self-seeking will slip away.</i>	12. Although I don't like to admit it, I'm still too focused on "me, me me" [†]	0.095	-0.019	-0.026	0.199	0.006	0.056
9. <i>Our whole attitude and outlook upon life will change.</i>	14. I have a more positive outlook on life [*]	0.629	0.333	0.619	0.275	0.329	0.403

12-Step Promise	Item	Factor 1: Psychological Wellbeing [*]			Factor 2: Freedom From Craving ^{**}		
		3 Month	6 Month	12 Month	3 Month	6 Month	12 Month
10. Fear of people and of economic insecurity will leave us.	5. I am less socially anxious than I used to be	0.150	0.359	0.477	0.291	0.204	0.241
	15. I am less scared of people than I used to be	0.163	0.168	0.305	0.236	0.075	0.281
	16. My financial situation may or may not have improved, but I don't worry as much about my finances	0.442	0.291	0.226	0.179	0.061	0.183
	23. I am not afraid to face people from my past [*]	0.376	0.182	0.496	0.153	0.109	-0.043
11. We will intuitively know how to handle situations which used to baffle us.	17. I am better able to handle things these days [*]	0.724	0.328	0.674	0.174	0.252	0.406
	24. I feel less confused about things [*]	0.630	0.303	0.642	0.384	0.230	0.243
	25. I find it easier to make decisions today than I used to [*]	0.535	0.293	0.660	0.376	0.318	0.364
12. We will suddenly realize that God is doing for us what we could not do for ourselves.	13. I could not have made substantial changes in my life without the help of a higher power	0.300	0.198	0.130	0.180	0.156	0.316
	18. I could not have made substantial changes in my life without outside help	0.259	0.140	0.378	0.095	0.136	0.128
Total variance explained by each factor		38.75%	27.38%	25.78%	18.52%	17.40%	21.25%
Internal consistency (Cronbach's alpha)		0.911	0.918	0.929	0.829	0.858	0.916

[†] Items reverse coded

^{*} Psychological wellbeing (factor 1) included items 1, 3, 4, 8, 9, 10, 14, 17, 22, 23, 24, 25 & 26

^{**} Freedom from craving (factor 2) included items 19, 20 & 21

Table 2

Spearman's rank order correlations among 12-step attendance, 12-step involvement, Promises subscales and PDA across time (3, 6, 12 months)

	Mean ± SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1. Attendance (3 mo)	0.49 ± 0.36	--	0.63 ***	0.46 ***	0.64 ***	0.55 ***	0.49 ***	0.48 *	0.13	0.25 **	0.09	0.16 *	0.33 ***	0.48 ***	0.39 ***	0.35 ***
2. Attendance (6 mo)	0.39 ± 0.33		--	0.60 ***	0.41 ***	0.75 ***	0.61 ***	0.21 **	0.21 **	0.33 ***	0.14	0.28 ***	0.33 ***	0.44 ***	0.56 ***	0.45 ***
3. Attendance (12 mo)	0.29 ± 0.28			--	0.36 ***	0.55 ***	0.77 ***	0.14	0.12	0.23 **	0.06	0.19 *	0.31 ***	0.31 ***	0.37 ***	0.49 ***
4. Involvement (3 mo)	5.67 ± 2.57				--	0.58 ***	0.43 ***	0.15 *	0.11	0.13	0.19	0.09	0.25 **	0.36 ***	0.34 ***	0.33 ***
5. Involvement (6 mo)	5.30 ± 2.96					--	0.59 ***	0.23 **	0.22 **	0.27 ***	0.16 *	0.24 ***	0.29 ***	0.44 ***	0.53 ***	0.43 ***
6. Involvement (12 mo)	5.09 ± 3.15						--	0.12	0.08	0.25 ***	0.06	0.19 *	0.32 ***	0.40 ***	0.42 ***	0.53 ***
7. Psychological Wellbeing (3 mo)	52.39 ± 7.98							--	0.61 ***	0.57 ***	0.61 ***	0.35 ***	0.35 ***	0.21 *	0.21 **	0.14
8. Psychological Wellbeing (6 mo)	52.69 ± 8.78								--	0.59 ***	0.50 ***	0.68 ***	0.33 ***	0.13	0.31 ***	0.14
9. Psychological Wellbeing (12 mo)	53.22 ± 9.20									--	0.40 ***	0.48 ***	0.69 ***	0.21 **	0.30 ***	0.33 ***
10. Freedom from Craving (3 mo)	11.27 ± 2.72										--	0.51 ***	0.38 ***	0.14	0.19 **	0.13
11. Freedom from Craving (6 mo)	11.63 ± 3.05											--	0.46 ***	0.19 *	0.36 ***	0.32 ***
12. Freedom from Craving (12 mo)	11.83 ± 3.22												--	0.27 ***	0.35 ***	0.48 ***
13. Percent Days Abstinent (3 mo)	0.93 ± 0.17													--	0.57 ***	0.45 ***
14. Percent Days Abstinent (6 mo)	0.87 ± 0.26														--	0.65 ***
15. Percent Days Abstinent (12 mo)	0.82 ± 0.30															--

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3
Mediation model Paths for the effects of 12-step meeting attendance and involvement on mediators and PDA

	Attendance				Involvement					
	B	SE	t	p	B	SE	t	p		
Fully Lagged Models[†]										
<i>Psychological Wellbeing</i>										
Path A: Attendance/Involvement	-1.491	2.104	-0.061	-0.71	0.480	0.311	-0.148	-1.70	0.091	
Path B: Psychological Wellbeing	-0.017	0.018	-0.089	-0.97	0.334	0.018	-0.079	-0.86	0.394	
Path C: Attendance/Involvement	0.644	0.428	0.137	1.50	0.135	0.064	0.136	1.46	0.148	
<i>Freedom from Craving</i>										
Path A: Attendance/Involvement	0.526	0.796	0.061	0.66	0.510	0.118	-0.103	-1.08	0.281	
Path B: Freedom from Craving	0.111	0.045	0.201	2.43	0.016	0.045	0.221	2.69	0.008	
Path C: Attendance/Involvement	0.652	0.428	0.138	1.52	0.130	0.064	0.143	1.54	0.127	
Partially Lagged Models[‡]										
<i>Psychological Wellbeing</i>										
Path A: Attendance/Involvement	5.592	2.302	0.201	2.43	0.016	0.193	0.282	0.060	0.495	
Path B: Psychological Wellbeing	0.023	0.014	0.130	1.63	0.105	0.030	0.014	0.168	2.17	0.031
Path C: Attendance/Involvement	1.577	0.397	3.201	3.97	0.000	0.199	0.048	0.352	4.19	0.000
<i>Freedom from Craving</i>										
Path A: Attendance/Involvement	2.505	0.860	0.248	2.91	0.004	0.194	0.105	0.167	1.85	0.066
Path B: Freedom from Craving	0.214	0.034	0.440	6.34	0.000	0.219	0.033	0.449	6.70	0.000
Path C: Attendance/Involvement	1.601	0.399	0.325	4.01	0.000	0.200	0.048	0.354	4.21	0.000

B: Parameter estimate; : Standardized parameter estimate

All models controlling for predictors of attrition (education), baseline levels of PDA, baseline levels of the mediator, and predictors of PDA (age, commitment to sobriety and self-efficacy at baseline)

[†]Fully fagged models: 12 month PDA, 6 month Promises subscale, 3 month attendance/involvement, 3 month SUD treatment;

[‡]Partially lagged models: 12 month PDA, 12 month Promises subscale, 6 month attendance/involvement, 6 month SUD treatment

Significance Tests of mediation and percent of mediated effect

Mediator	Attendance			Involvement		
	% of total mediated effect	Indirect : Direct Ratio	Sobel Test Statistic	% of total mediated effect	Indirect : Direct Ratio	Sobel Test Statistic
<i>Fully Lagged Models</i>						
Psychological Wellbeing	3.93	0.041	0.572	8.61	0.094	0.764
Freedom from Craving	8.92	0.098	0.638	15.92	-0.137	-1.004
<i>Partially Lagged Models</i>						
Psychological Wellbeing	8.12	0.089	1.354	2.87	0.030	0.652
Freedom from Craving	33.57	0.505	2.648	21.17	0.268	1.783