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## Slow and Steady Wins the Race: A Randomized Clinical Trial of Acceptance and Commitment Therapy Targeting Shame in Substance Use Disorders

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### Abstract

**Objective**—Shame has long been seen as relevant to substance use disorders, but interventions have not been tested in randomized trials. This study examined a group-based intervention for shame based on the principles of acceptance and commitment therapy (ACT) in patients ( $N = 133$ ; 61% female;  $M = 34$  years old; 86% Caucasian) in a 28-day residential addictions treatment program.

**Method**—Consecutive cohort pairs were assigned in a pairwise random fashion to receive treatment as usual (TAU) or the ACT intervention in place of 6 hr of treatment that would have occurred at that same time. The ACT intervention consisted of three 2-hr group sessions scheduled during a single week.

**Results**—Intent-to-treat analyses demonstrated that the ACT intervention resulted in smaller immediate gains in shame, but larger reductions at 4-month follow-up. Those attending the ACT group also evidenced fewer days of substance use and higher treatment attendance at follow-up. Effects of the ACT intervention on treatment utilization at follow-up were statistically mediated by posttreatment levels of shame, in that those evidencing higher levels of shame at posttreatment were more likely to be attending treatment at follow-up. Intervention effects on substance use at follow-up were mediated by treatment utilization at follow-up, suggesting that the intervention may have had its effects, at least in part, through improving treatment attendance.

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**Conclusions**—These results demonstrate that an approach to shame based on mindfulness and acceptance appears to produce better treatment attendance and reduced substance use.

### Keywords

shame; substance use disorder; stigma; mindfulness; acceptance and commitment therapy

Shame has long been seen as relevant to substance use disorders and their treatment, but the precise nature of the relationship and how best to address it clinically are controversial. The emotion of shame emerges when a seemingly flawed self is revealed to oneself or others (Dearing, Stuewig, & Tangney, 2005). While shame can have adaptive social functions such as solidifying social roles, evoking sympathy, or appeasing others following the violation of social roles or norms (Kemeny, Gruenewald, & Dickerson, 2004; Tracy & Robins, 2004), it typically serves a deleterious function in the context of substance misuse.

Shame is more common among those with substance use problems than those without such problems (Cook, 1987; Dearing et al., 2005), evokes substance use (e.g., Mohr, Brannan, Mohr, Armeli, & Tennen, 2008), and predicts relapse during Alcoholics Anonymous participation (Wiechelt & Sales, 2001). Shame is also the emotional core of self-stigma, which has been associated with treatment-seeking delays (Kushner & Sher, 1991), treatment dropout (Sirey et al., 2001), and poorer social functioning (Perlick et al., 2001).

Nonetheless, with a few notable exceptions, there are few data on interventions aimed at alleviating shame (Gilbert & Procter, 2006; Rizvi & Linehan, 2005). A variety of substance use treatments address shame in addiction (e.g., Cook, 1991; Potter-Efron, 2002), yet none have been systematically evaluated.

The present study was based on the idea that at least two contexts link shame to problematic outcomes such as treatment dropout (Sirey et al., 2001), poor social functioning (Tangney & Dearing, 2002), and substance misuse (Mohr et al., 2008). First, through a process termed cognitive fusion, attachment to the literal meaning of self-critical and self-devaluing thoughts increases the likelihood of destructive behaviors such as substance use. These destructive behaviors then further reinforce a negative self-concept (Hayes, Strosahl, & Wilson, 1999). Second, through a process termed experiential avoidance—the tendency to avoid difficult private experiences as a method of behavioral regulation even when it leads to problems (Hayes, Luoma, Bond, Masuda, & Lillis, 2006)—substances are used to avoid and suppress shame and other negative emotions. This reduces access to the potentially useful functions of shame, such as signaling a violation of social roles and personal values. It may also serve to amplify shame since suppression and avoidance tend to lead to rebounding of the thought or feeling being suppressed (Hayes et al., 2006; Wenzlaff & Wegner, 2000). Empirically, experiential avoidance has been correlated with higher levels of shame (Luoma et al., 2007; Mitmansgruber, Beck, Höfer, & Schüßler, 2009) and shown to mediate the impact of shame on self-destructive behaviors (Etzel, 2006). If this is how shame drives problem behaviors in substance use, key treatment targets for shame should be cognitive fusion with conceptions of a flawed self and experiential avoidance of emotions that might otherwise serve an adaptive role in fostering social repair or altering destructive behavior patterns.

For substance abusers, acceptance and mindfulness might be adaptive responses to difficult internal experiences such as shame or negative self-judgment. For example, mindfulness meditation with prisoners resulted in significant reductions in avoidance of thoughts, which partially mediated the effects of the meditation course on later alcohol use (Bowen, Witkiewitz, Dillworth, & Marlatt, 2007). Among college students, acceptance has been found to moderate the effect of automatic alcohol motivation on drinking behaviors (Ostafin & Marlatt, 2008).

The present study explored the effects of a mindfulness and acceptance-based intervention, acceptance and commitment therapy (ACT), for shame in those with substance use disorders. ACT has demonstrated positive outcomes for opiate addiction (Hayes et al., 2004), chronic marijuana use (Twohig, Shoenberger, & Hayes, 2007), alcohol use disorders (Petersen & Zettle, 2009), and nicotine dependence (e.g., Gifford et al., 2004, in press). In an ACT approach, rather than trying to reduce or eliminate shame, psychological acceptance techniques encourage participants to notice and experience shame and other difficult feelings more fully, while reducing their conditioned link to overt action. Negative self-judgments such as “I’m a loser” or “I am evil” are addressed by cognitive defusion: noticing the process of thinking, letting go of attachment to the literal content of thoughts, responding to thoughts in terms of the workability of behavior tied to them, and then shifting attention toward values-based actions. A previous study piloted the present approach in an open trial (Luoma, Kohlenberg, Hayes, Bunting, & Rye, 2008) as part of a 28-day inpatient program. Because there was no control group, it was impossible to know whether the apparently positive results were the result of other aspects of the program or due to the ACT intervention. The present study is the first randomized trial to test an ACT approach to shame in a sample of persons struggling with substance use disorders.

## Method

### Participants

Participants were 133 adults (61 female, 72 male; mean age = 33.6 years) diagnosed with a substance use disorder participating in a 28-day residential treatment program in Reno, Nevada. Fourteen percent of the participants identified themselves as non-Caucasians—African American ( $n = 6$ ), American Indian ( $n = 3$ ), Asian/Pacific Islander ( $n = 1$ ), other ( $n = 7$ )—and 13% ( $n = 17$ ) as Hispanic. The most common substances used in the 30 days prior to program entry were alcohol, methamphetamine, and marijuana (see Table 1). There was no significant difference between conditions on the number of substances used (mean treatment as usual [TAU] = 2.3, mean ACT = 1.9, Mann–Whitney  $U = 1,393$ ,  $p = .18$ ). The number of substances used or whether particular substances were used before program entry did not relate significantly to substance use outcomes during follow-up and did not affect the treatment outcomes reported here. All participants qualified for a diagnosis of substance abuse or dependence as a prerequisite for admittance to treatment.

### Procedure

**Recruitment and incentives**—Recruitment was conducted in waves. Study staff met with treatment staff to identify eligible participants who were then given a flyer and invited

to the initial assessment. During this session, those who consented to participate completed the preintervention assessment battery and were then informed of condition assignment. Those who were about to be discharged or who unit staff identified as having a severe cognitive impairment that would obstruct participation in the group were not invited to the initial assessment meeting.

**Study design**—Consecutive pairs of cohorts were assigned in a pairwise random fashion to receive either TAU or the 6-hr intervention in place of 6 hr of treatment that would have occurred at that same time (TAU + ACT; referred to as the ACT condition in the rest of the article). The design was similar to an additive treatment design, except that those in the ACT condition participated in 6 hr less of their regular program than those in TAU. TAU at this facility consisted of five or six therapy groups per day, 6 days per week. Seven were process groups, with the rest of the groups focusing on life skills, relapse prevention, parenting, physical health issues, recreational therapy, and anger management. The 2 hr of individual therapy per week often focused on 12-step facilitation. Therapy attendance was estimated by the clinical director to be over 90%, but actual attendance was not recorded. The residential program was designed to last 28 days (actual average length of attendance = 29.27 days,  $SD = 12.7$ , range = 2–74). A CONSORT chart is shown in Figure 1.

**Assessment schedule**—In both conditions, pre- and postassessments were held 1 week apart. Between these first two assessment points, the group intervention was delivered to those in the ACT condition, while those in the TAU group attended their normal program. Sixteen cohorts participated in the study, half assigned to each condition. Cohorts varied in size from three to 17, with ACT groups having from five to 17 individuals. Participants also completed a 4-month follow-up. Participants received department store gift certificates for completing assessments, valued at \$5 for the preassessment, \$10 for the postassessment, and \$45 for the follow-up.

### ACT for Shame Intervention

The ACT intervention consisted of three 2-hr group sessions scheduled during a single week. Sessions followed an intervention manual that was developed and tested in an initial open trial using an independent sample of patients (Luoma et al., 2008). The manual is available from the authors (or at [www.contextualpsychology.org/treatment\\_protocols](http://www.contextualpsychology.org/treatment_protocols)). Participants were told that the groups were intended to help them overcome shame, stigmatization, and judgments of self and other. Standard ACT exercises were modified to focus on how to respond to shame and self-stigmatizing thoughts in a way that would not obstruct recovery. The first session focused on the workability of suppression and avoidance, and a rationale for defusion and acceptance skills was built using well-known ACT exercises such as the polygraph metaphor and the bus metaphor (Hayes et al., 1999). The second session taught defusion and acceptance skills through such exercises as 30 s of word repetition focused on a negative self-judgment, a procedure known to reduce both fusion with thoughts and the distress they evoke (Masuda, Hayes, Sackett, & Twohig, 2004). The second session also included a mindfulness exercise, acting out a tug of war with a negative thought, and publicly sharing negative self-judgments by writing them on name tags. The third session included another mindfulness exercise and led participants to identify life goals

and values. The session had a particular focus on building a positive agenda of human connection and values related to treatment participation. Finally, participants wrote out an epitaph for their life and shared their values, goals, needed actions, and expected barriers.

### Treatment Structure and Fidelity Coding

ACT groups were co-led by two therapists. Study therapists included two psychologists and one addictions counselor, each of whom had been conducting ACT groups with substance use disorder patients for at least 4 years and who had also led groups during the pilot project (Luoma et al., 2008). Therapists met before each wave of participants to review the manual and to rehearse the treatment. They debriefed difficult or ambiguous situations after sessions as they occurred.

For the purposes of coding, each 2-hr session was divided into three segments of approximately 40 min each. The first 40-min segment from the first session of each cohort was excluded from coding because it focused mostly on personal introductions and program overview. Coders were three clinical psychology graduate students who had at least 2 years of ACT training and clinical experience. Coding training consisted of approximately 30 hr of didactic instruction, discussion, and practice with coding segments from the pilot project.

A recent review of ACT adherence and competence rating systems (Plumb & Vilaradaga, 2010) recommended a functional rating method in which specific ACT processes and contraindicated processes are evaluated for their frequency of occurrence and depth of coverage and all of these items are then considered in an overall rating of adherence and competence. Five ACT targets (willingness, values, committed action, workability, and defusion), two nonspecific targets (stigma/shame discussion not related to ACT processes, therapeutic relationship), and four processes contraindicated by ACT (promoting experiential avoidance, challenging cognitions, suggesting thoughts or feelings cause actions, evaluating the accuracy of thoughts) were evaluated on a 1–5 scale. Ratings of 1 and 2 indicated that the target process was not seen (1) or was seen but not addressed in depth (2). Ratings of 3 and 4 indicate that the process was addressed in moderate depth and was seen during the segment either *several times* (3) or *with high frequency* (4). A rating of 5 indicated that the process was addressed frequently and in great depth. Overall adherence and competence ratings were then taken, considering all indicated and contraindicated items and expecting at least moderate depth of coverage in an ACT process in each major segment.

Eight audio-recorded segments were randomly selected for coding from the 46 available segments (recordings of two groups were lost due to a technical error). High levels of interrater reliability were demonstrated, with a single-member intraclass correlation coefficient of .84. All segments showed moderate to heavy depth of coverage (score of 3.0 or higher) for one or more ACT processes (average number of ACT processes covered = 2.1; range = 1–4). In correspondence with the manual, all of the segments taken from the first two sessions had high (3+) scores in defusion, acceptance, and workability or their combination, but not for values or action. All of the segments from the third group session all had high (3+) ratings for values, action, or their combination and high ratings for acceptance, but not for workability or defusion. ACT processes scheduled to be regularly targeted during the specific session averaged 3.33, processes not expected to be targeted

averaged 1.49, and nonspecific items averaged 1.58 overall. Contraindicated items averaged 1.04, approaching the floor of the scale. Ratings of overall adherence and competence, which raters were asked to base on the seven indicated and contraindicated items, averaged 4.88 and 4.70, respectively, nearing the ceiling for the scale.

## Measures

Measures were taken at all time points unless otherwise noted. Internal consistency (Cronbach alphas) results reported below are from the baseline assessment.

**Primary outcomes**—Three outcome measures were considered primary: internalized shame because that was the primary focus of the therapy group, continued involvement in drug and alcohol treatment after release because this is a pathway to improved long-term outcomes for residential substance abuse programs (McLellan, Lewis, O'Brien, & Kleber, 2000) and a specific target of the ACT intervention, and follow-up drug and alcohol use because that is a defining feature of addiction.

**Internalized shame:** The Internalized Shame Scale (ISS;  $\alpha = .97$ ; Cook, 1987), is a 24-item self-report questionnaire measuring internalized shame. Due to a clerical error, the present study used a 7-point scale from 1 (*never*) to 7 (*always*), rather than the 0 – 4 scale used originally. The ISS has previously shown good test–retest and construct validity (Cook, 1987).

**Treatment utilization:** Participants were interviewed at follow-up using the Treatment Services Review (TSR; McLellan, Alterman, Cacciola, Metzger, & O'Brien, 1992) to assess treatment services used in the previous 14 days. The TSR measures use of services in each of seven areas: psychiatric, medical, legal, employment, family, drug treatment, and alcohol treatment. A total score for each area is created by summing the items that relate to treatment utilization. Total substance misuse treatment utilization was calculated by summing the eight items from the alcohol scale and the nine items from the drug scale that relate to treatment utilization. We selected the 14-day interview because of its demonstrated test–retest reliability and criterion validity in past research (McLellan et al., 1992).

**Drug and alcohol use:** Substance use was assessed at the 4-month follow-up using the Alcohol and Drug Timeline Follow-back Interviews (TLFB; Sobell & Sobell, 1996). To maximize our observation window, we selected the version that assesses days of alcohol or drug use over the previous 3 months. TLFB measures have been widely used and are generally found to be reliable (Fals-Stewart, O'Farrell, Freitas, McFarlin, & Rutigliano, 2000). To obtain some indication of the reliability of the TLFB self-report, 58 participants provided saliva samples at follow-up that were tested by LabOne for cocaine, amphetamines, marijuana, opiates, and phencyclidine. Of the 13 participants reporting drug use within the last 30 days, 31% showed a positive objective screen. Conversely, of the 45 who denied drug use, two individuals (4%, one from each condition) showed a positive objective screen. These results provide some limited objective support for the validity of the self-reports.



**Secondary outcomes**—Three outcome measures were considered to be secondary: general mental health, social support, and quality of life. All are outcomes that relate to the long-term adjustment of substance abusing populations (Clark, 2001; Compton, Cottler, Jacobs, Ben-Abdallah, & Spitznagel, 2003).

**Overall mental health:** The General Health Questionnaire-12 ( $\alpha = .89$ ; Vieweg & Hedlund, 1983) is a 12-item self-report scale designed to measure general mental health and stress that has been widely used and well validated. Higher scores indicate better general mental health.

**Quality of life:** The Quality of Life Scale ( $\alpha = .93$ ; Flanagan, 1978) is a 16-item self-report scale that measures several aspects of functional status in areas such as work, social, family contact, and daily activities. The measure has shown good test–retest and construct validity (Burckhardt, Woods, Schultz, & Ziebarth, 1989) and is sensitive to interventions in substance misusing populations (Luoma et al., 2008). Higher scores reflect higher quality of life.

**Social support:** The Multidimensional Scale of Perceived Social Support ( $\alpha = .94$ ; Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item self-report scale designed to assess perceived social support. The measure has shown good reliability and validity in previous studies (Dahlem, Zimet, & Walker, 1991). Higher scores indicate weaker social support.

## Results

Table 2 shows the obtained means for all outcome measures for the two conditions for each measurement occasion. There were no pretreatment differences on any measure reported here. In all cases, figures show adjusted means.

### Outcome Analytic Strategy

Hierarchical linear modeling (HLM) and mixed model repeated measures (MMRM) approaches were used to analyze the intent-to-treat sample (Raudenbush & Bryk, 2001). It was assumed that outcomes varied within subjects over time as a function of a person-specific growth curve (Level 1), nested within cohorts (Level 2), and treatment assignment (Level 3).

Although HLM analyses were first conducted on all measures, in cases involving pretreatment, posttreatment, and follow-up data, outcomes were generally not linear in the TAU condition. Thus, MMRM, which treats time as categorical, was the primary analytic method. The simplest covariance structure not significantly different than an unstructured one was used; in all cases but one (noted below), the unstructured covariance structure was superior and used. Each analysis modeled a random effect for cohort, which allows for heterogeneity between cohorts; if it did not converge (as indicated by the Hessian matrix not positive definite), analyses without nesting by cohort were reported if there was no significant cohort or Time  $\times$  Cohort effect within each arm of the study. For measures requiring full nesting due to a significant cohort or Time  $\times$  Cohort effect but in which fully nested MMRM analyses did not converge, a repeated measures analysis of covariance was

conducted that treated cohorts themselves as individual subjects, using cohort means as scores (termed an *aggregate analysis*; Hedeker, Gibbons, & Flay, 1994, p. 758). Effects found using an aggregate analysis were dismantled using contrasts based on two-level MMRM analyses. A different analytic approach was used for substance use, as described later.

Denominator degrees of freedom were based on the Satterthwaite approximation; time value for initial assessments in all analyses was set to zero, and time was modeled by sequential assessment occasion. Effect sizes, converted to Cohen's *d* (Cohen, 1992), were derived for overall *F*-test statistics as suggested by Rosenthal and Rosnow (1991). Effect sizes for within-group contrasts were calculated following Wackerly, Mendenhall, and Scheaffer (2008, p. 271).

## Primary Outcomes

**Substance use outcomes**—Substance abuse outcomes were analyzed using generalized linear mixed models (GLMMs). For each of the 13 weeks in the TLFB, participants were scored either as drug and alcohol free or as having used substances (see Figure 2). GLMM is appropriate for the present case because it allows for full nesting of scores and can accommodate binary data (Breslow & Clayton, 1993). Wolfinger and O'Connell's (1993) refinement of the Breslow and Clayton (1993) approach was used.

A GLMM analysis with an autoregressive heterogeneous covariance structure best fit the data and showed a significant difference between treatment conditions,  $F(1, 941) = 5.35$ ,  $p = .02$ , but not an effect for week ( $p = .49$ ) or an interaction of treatment and week ( $p = .91$ ). The odds ratio for ACT participants not using during a given week was 2.32 (95% CI [1.14, 4.74]), showing that they were more than 2¼ times more likely to not use substances during any week than participants in TAU were.

These results were confirmed using generalized estimating equation (GEE) methodology (Liang & Zeger, 1986). GEE can only accommodate two levels of nesting (time and condition) but showed the same set of significant effects; the odds ratio for ACT participants was only slightly higher (2.68,  $SE = 1.21$ , 95% CI [1.10, 6.49]) suggesting limited cohort effects.

**Treatment utilization**—Combined drug or alcohol treatment utilization at follow-up was the main focus of this analysis. As there was no time factor with this measure, a random intercept HLM model that nested participants within cohorts was conducted. There was a significant effect for condition,  $F(1, 10.998) = 5.41$ ,  $p = .04$ , with those in the ACT group utilizing 82% more drug and alcohol treatment ( $M = 19.11$ ,  $SE = 2.48$ ) than those in the control group ( $M = 10.48$ ,  $SE = 2.53$ ). Similar patterns were shown for drug and alcohol treatment when viewed separately, with ACT participants utilizing 63% more alcohol treatment services ( $p = .06$ ) and 124% more drug treatment services ( $p = .04$ ). There were no significant differences between conditions in the utilization of other services (psychological, medical, legal, employment, or family).



**Internalized shame**—A fully nested MMRM analysis showed no effect for treatment condition ( $p = .83$ ), but there was a significant effect for time ( $p < .001$ ) and the interaction of condition and time,  $F(1, 99.60) = 3.59$ ,  $p = .03$ , effect size = .38 (a small effect). Contrary to expectation, TAU participants showed a medium and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = -11.47$ ,  $SE = 2.99$ ,  $t(119.10) = -0.84$ ,  $p = .00$ , 95% CI  $[-17.39, -5.55]$ , effect size = .51, but this decreased to a small and nonsignificant change from pretreatment to follow-up,  $M_{\text{diff}} = -6.25$ ,  $SE = 4.25$ ,  $t(86.67) = -1.47$ ,  $p = .15$ , 95% CI  $[-14.71, 2.19]$ , effect size = .22. Conversely, participants in the ACT condition showed a small and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = -5.78$ ,  $SE = 2.85$ ,  $t(117.31) = -2.03$ ,  $p = .045$ , 95% CI  $[-11.43, -0.13]$ , effect size = .26, which increased to a medium and significant improvement through the follow-up period,  $M_{\text{diff}} = -18.55$ ,  $SE = 4.38$ ,  $t(86.89) = -4.23$ ,  $p = .000$ , 95% CI  $[-27.26, -9.83]$ , effect size = .66. The effect is shown visually in Figure 3, along with the other psychosocial outcomes.

On the basis of the standard deviation (31.21) and alpha values obtained in the present study, a change of more than 15.95 from pre- to posttreatment or follow-up was considered reliable (Jacobson & Truax, 1991). There were no significant differences in reliable change rates at posttreatment. At follow-up, 19.7% of the TAU participants had improved and 15.2% deteriorated, as compared to 30.9% improved and 2.9% having deteriorated in the ACT condition, a significant difference in improvement (Fisher's exact,  $p = .04$ ) and deterioration (Fisher's exact,  $p = .026$ ).

## Secondary Outcomes

**General mental health**—An MMRM analysis that nested participants within cohorts did not converge, but there was no effect for cohort or the Cohort  $\times$  Time interaction for either arm of the study ( $p = .5$ ); thus, a nonnested analysis was conducted. The analysis showed no effect for treatment condition ( $p = .73$ ), but there was a significant effect for time ( $p < .001$ ) and the interaction of condition and time,  $F(1, 103.2) = 3.60$ ,  $p = .031$ , effect size = .36. The interaction occurred because the control participants showed a medium and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = 5.01$ ,  $SE = 0.95$ ,  $t(125.03) = 5.24$ ,  $p < .001$ , 95% CI  $[3.12, 6.90]$ , effect size = .69, but no change (now in the direction of deterioration) from pretreatment to follow-up,  $M_{\text{diff}} = -0.16$ ,  $SE = 1.41$ ,  $t(98.73) = -0.11$ ,  $p = .91$ , 95% CI  $[-2.95, 2.63]$ , effect size = -.02. Participants in the ACT condition also showed a medium and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = 4.26$ ,  $SE = 0.92$ ,  $t(121.93) = 4.64$ ,  $p < .001$ , 95% CI  $[2.44, 6.07]$ ,  $d = .59$ , but retained a small and significant improvement through the follow-up period,  $M_{\text{diff}} = 4.49$ ,  $SE = 1.44$ ,  $t(99.85) = 3.12$ ,  $p = .002$ , 95% CI  $[1.64, 7.35]$ , effect size = .46.

A change score of 6.77 or more was considered reliable. There were no significant differences at posttreatment on this metric. At follow-up, 32.5% of the TAU condition had deteriorated and 30% improved, compared to 5.4% deterioration and 35.1% improvement in the ACT condition, a significant difference in deterioration (Fisher's exact,  $p = .003$ ).

**Quality of life**—There was an effect for cohort within the control arm of the study ( $p = .032$ ), necessitating a fully nested analysis. Because the MMRM analysis did not converge,

an aggregate analysis (Hedeker et al., 1994) using repeated measures analysis of covariance (ANCOVA) was deployed, treating cohorts as subjects and using pretreatment scores as the covariate.

The analysis showed no effect for treatment condition ( $p = .27$ ) or time ( $p = .26$ ), but there was a marginally significant interaction of condition and time,  $F(1, 13) = 3.65$ ,  $p = .078$ , partial  $\eta^2 = .22$  (a large effect). The interaction was dismantled using contrasts in a two-level MMRM. Results showed a similar pattern as other measures. Control participants showed a small and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = -5.82$ ,  $SE = 1.86$ ,  $t(120.71) = 3.12$ ,  $p = .002$ , 95% CI [2.13, 9.52], effect size = .41, but no significant change from pretreatment to follow-up,  $M_{\text{diff}} = -0.16$ ,  $SE = 1.41$ ,  $t(98.73) = -0.11$ ,  $p = .91$ , 95% CI [-2.95, 2.63], effect size = .10. Participants in the ACT condition also showed a small and significant improvement from pre- to posttreatment,  $M_{\text{diff}} = 4.88$ ,  $SE = 1.79$ ,  $t(117.38) = 2.73$ ,  $p = .007$ , 95% CI [1.34, 8.43], effect size = .34, which was maintained through the follow-up period,  $M_{\text{diff}} = 9.46$ ,  $SE = 2.98$ ,  $t(95.83) = 3.18$ ,  $p = .002$ , 95% CI [3.56, 15.37] effect size = .47.

**Social support**—There was an effect for cohort within both arms of the study, necessitating a nested analysis. Because a fully nested MMRM analysis did not converge, an aggregate repeated measures ANCOVA was applied and showed no effect for treatment condition ( $p = .30$ ), a significant effect for time ( $p = .011$ ), and a significant and large interaction of condition and time,  $F(1, 13) = 6.33$ ,  $p = .026$ , partial  $\eta^2 = .33$ . Control participants showed no significant improvement from pre- to posttreatment (note, in interpreting these values, that lower scores mean greater social support),  $M_{\text{diff}} = -1.24$ ,  $SE = 1.57$ ,  $t(124.40) = -0.795$ ,  $p = .428$ , 95% CI [-4.36, 1.86], effect size = .10, or pretreatment to follow-up,  $M_{\text{diff}} = -1.70$ ,  $SE = 2.52$ ,  $t(91.58) = -0.675$ ,  $p = .50$ , 95% CI [-6.70, 3.31], effect size = .11. Participants in the ACT condition also showed no significant improvement from pre- to posttreatment,  $M_{\text{diff}} = -1.93$ ,  $SE = 1.50$ ,  $t(120.11) = -1.28$ ,  $p = .202$ , 95% CI [-4.91, 1.405], effect size = .16, but significant improvement during the follow-up period,  $M_{\text{diff}} = -7.11$ ,  $SE = 2.56$ ,  $t(91.88) = -2.78$ ,  $p = .007$ , 95% CI [-12.19, -2.03], effect size = .42.

### Shame and Substance Use

In the ACT condition, shame at posttreatment was unrelated to weeks with substance use at follow-up, Spearman's  $r(31) = .09$ ,  $p = .64$ , while shame at follow-up was related to use at follow-up,  $r(34) = .47$ ,  $p = .005$ . In the TAU arm, a correlation approached significance where lower levels of shame at posttreatment predicted more weeks of substance use,  $r(31) = -.301$ ,  $p = .10$ , at follow-up, but follow-up shame was unrelated to substance use,  $r(36) = .21$ ,  $p = .21$ . When observing pre- to postassessment changes in shame, greater decreases in shame from pre- to post-treatment in the TAU arm predicted a significantly higher number of weeks with substance use during follow-up,  $r(31) = -.41$ ,  $p = .02$ , a relationship that was similar in the ACT condition,  $r(31) = -.36$ ,  $p = .04$ . Together, these results suggest that there was something artificial or unsustainable about the shame levels produced in the TAU condition, a process that was ameliorated somewhat in the brief ACT intervention, where

few people showed a sharp decrease in shame scores. This possibility was further explored in the context of a mediation analysis.

### Mediation Analysis

Mediation refers to a statistical difference between a regression testing a direct path regressing treatment on outcome (c) and the indirect path (treatment on outcome accounting for the mediator or  $c'$ ). The significance of the cross-product of the a path (treatment on the mediator) and b path (relation of the mediator to outcome, controlling for treatment) is widely viewed as one of the best tests of mediation (MacKinnon, Lockwood, Hoffman, West, & Shee, 2002). However, because the cross-product is generally not normally distributed (Preacher & Hayes, 2004), a nonparametric method using bootstrapping was applied (Preacher & Hayes, 2004, 2008). The present set of analyses based parameter estimates on 3,000 bootstrapped data sets. Values generated by normal theory and the bootstrapped cross-product values with bias-corrected and accelerated confidence intervals are shown in Table 3.

The difference in weeks with substance use during follow-up was mediated by the impact of ACT on subsequent utilization of treatment services (point estimate =  $-0.48$ , 95% CI [ $-1.28$ ,  $-0.08$ ]). The significant differential impact of ACT on weeks of use,  $t(73) = -2.08$ ,  $p < .05$ , became nonsignificant,  $t(73) = -1.55$ ,  $p = .13$ , when accounting for the effect of treatment utilization (see Table 3; proportion of effect mediated = .25). When treatment utilization was examined as the outcome of interest and weeks of use tested as a mediator, it too was significant, but less strongly (point estimate =  $1.75$ , 95% CI [ $0.15$ ,  $4.68$ ]), and the differential impact of ACT on treatment utilization,  $t(73) = 2.22$ ,  $p = .03$ , was closer to significance,  $t(73) = 1.72$ ,  $p = .09$ , when accounting for weeks of use (see Table 3). Given the known importance of treatment utilization to outcomes (e.g., Ouimette, Moos, & Finney, 1998; Ritsher, Moos, & Finney, 2002), it seems more reasonable to suppose that treatment utilization may have helped decrease substance use; subsequently, posttreatment score mediators of subsequent treatment utilization were examined.

Examining all posttreatment measures as potential mediators, treatment utilization during follow-up was mediated only by differences in posttreatment levels of shame (point estimate =  $1.73$ , 95% CI [ $0.01$ ,  $5.54$ ]). The significant differential impact of ACT on treatment utilization,  $t(68) = 2.20$ ,  $p < .05$ , became nonsignificant,  $t(68) = 1.53$ ,  $p = .14$ , when accounting for the unexpected difference in posttreatment levels of shame (see Table 3; proportion mediated = .24). Reversed mediational analyses (treatment use as a mediator of either posttreatment or follow-up levels of shame) were nonsignificant ( $p = .5$ ). While shame went down in the ACT condition from pre- to posttreatment, TAU had even lower levels of shame at post,  $t(68) = 2.04$ ,  $p < .05$ , and controlling for treatment, higher levels of posttreatment shame led to marginally higher levels of treatment utilization,  $t(68) = 1.97$ ,  $p = .06$ . Posttreatment levels of shame also showed a trend toward functioning as a mediator of weeks of use ( $p = .08$ ), but when treatment utilization and shame were both entered in multiple mediator models, only treatment utilization remained significant, suggesting that the slower reduction in shame seen in the ACT condition contributed to more treatment involvement and, thus, better substance use outcomes.

## Discussion

To our knowledge, the present study is the first randomized trial in a substance use population in which the central target of the treatment was shame. A 6-hr group using an ACT approach to shame as a small part of a 28-day residential program led to slower immediate gains in shame but better long-term progress. The slower posttreatment gains in the ACT group compared to TAU were not predicted but were made sense of by subsequent analyses. Results indicated that reductions in shame during active treatment predicted higher levels of substance use at follow-up. Mediation analyses suggested that the more gradual reductions in shame found in the ACT group protected against the pattern seen in TAU for shame reductions to be associated with subsequent higher levels of substance use. As predicted, the ACT intervention led to higher levels of outpatient treatment attendance during follow-up, which in turn were functionally related to lower levels of substance use. Across the board, participants in the ACT condition showed a pattern of continuous treatment gains, especially on psychosocial measures, rather than the boom and bust cycles seen in TAU.

It seems highly unlikely that a 6-hr group alone was responsible for the gains seen, but rather something in the 6 hr spent in the ACT group changed the overall effect of this residential program. Unhealthy suppression of shame may be involved in the treatment high sometimes seen in early recovery in which sobriety can lead to unrealistic treatment gains, only to be followed by urges to use, relapse, or depression (e.g., Brook & Spitz, 2002, p. 72). Those in the 12-step tradition have discussed this as the “pink cloud” or “rosy glow” phenomenon, but with a few exceptions (e.g., Mowbray et al., 1995; Najavits, Weiss, & Liese, 1996), relatively little has been written about it within scientific journals. It seems plausible that these 6 hr kept participants from interacting with the overall treatment program in a way that produced illusory short-term gains, perhaps by helping them experience shame in a more open and mindful fashion, thereby allowing the emotion to perform its regulatory function of warning against or punishing violations of personal values or social norms and of helping to repair strained social roles. The resulting improvement in functioning and reintegration into healthy social networks, such as those found in a recovery community, led to less shame over time.

Similar patterns, where reports of relatively more negative thinking were linked to positive outcomes, have been seen in other studies of ACT. For example, Varra, Hayes, Roget, and Fisher (2008) found that addictions counselors exposed to ACT before training on the use of agonists and antagonists to treat substance misuse reported more barriers to using these technologies but also more willingness to do so. Similarly, Bach and Hayes (2002) found that inpatients suffering from delusions and hallucinations who were exposed to a short ACT intervention reported less reduction in these symptoms than TAU, while at the same time being better able to function outside of the hospital. Similar findings exist for self-confidence (Lappalainen et al., 2007) and barriers to applying training (Varra et al., 2008). Across these studies, initially higher posttreatment levels of difficult thoughts or feelings became, in effect, indicators of healthy acceptance processes that were part of longer term gains.

There are limitations to the present study. Although a full intent-to-treat analysis was used, there was a fair amount of missing data at follow-up. Severe substance abusing populations can be difficult to track through follow-up, and ethical restrictions can amplify this effect (e.g., 57% of participants were involved in legal processes, but the institutional review board prohibited contact if they were placed in prison). It is also difficult to characterize TAU in a residential program because of the amount and complexity of treatment received. The ACT intervention could have produced effects that were due to the addition of attention from providers outside the unit or unusually skilled therapists. Our measure of shame was limited to the ISS, but it has not yet been agreed upon how to accurately measure situational levels of shame or distinguish it from guilt, an emotion that has more generally been found to be adaptive (Tangney & Dearing, 2002). Thus, improvements related to shame may have also been connected to changes in guilt. The comparability of this sample to others is unclear, as data were not collected on the number of participants who declined to participate or were determined to be ineligible; TLFB data were also not collected pretreatment. Finally, lack of blinding makes it possible that the better outcomes in the ACT condition may have been due to expectations of greater improvement among participants or staff on the treatment unit. While those possibilities cannot be fully eliminated, the fact that improvement was actually slower at first for ACT participants suggests that the effects do not exclusively reflect demand characteristics.

Many people with substance use disorders experience shame as a result of the stigma of substance abuse, failure to control their substance use, and failures in role functioning. Understandably, people are motivated to avoid or reduce this extremely painful affect. Unfortunately, when the emotion of shame itself becomes the target of avoidance, this may exacerbate shame in the long run, even though it may provide some relief in the short term. In a similar way, while negative self-conceptions are painful, direct change efforts can paradoxically increase the frequency and regulatory power of negative self-conceptions. Results of this study suggest that acceptance and mindfulness-based interventions may help people to step out of a cycle of avoidance and shame and move toward a path of successful recovery that leads to more stable reductions in shame and to more functional ways of living.

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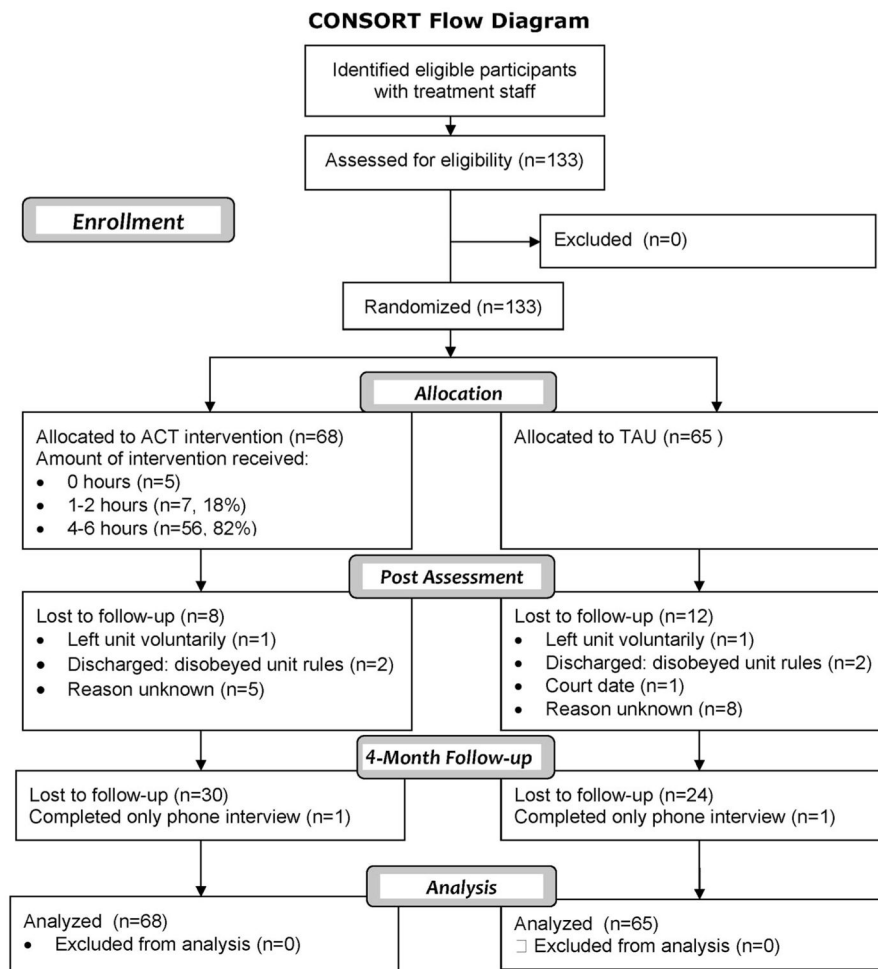
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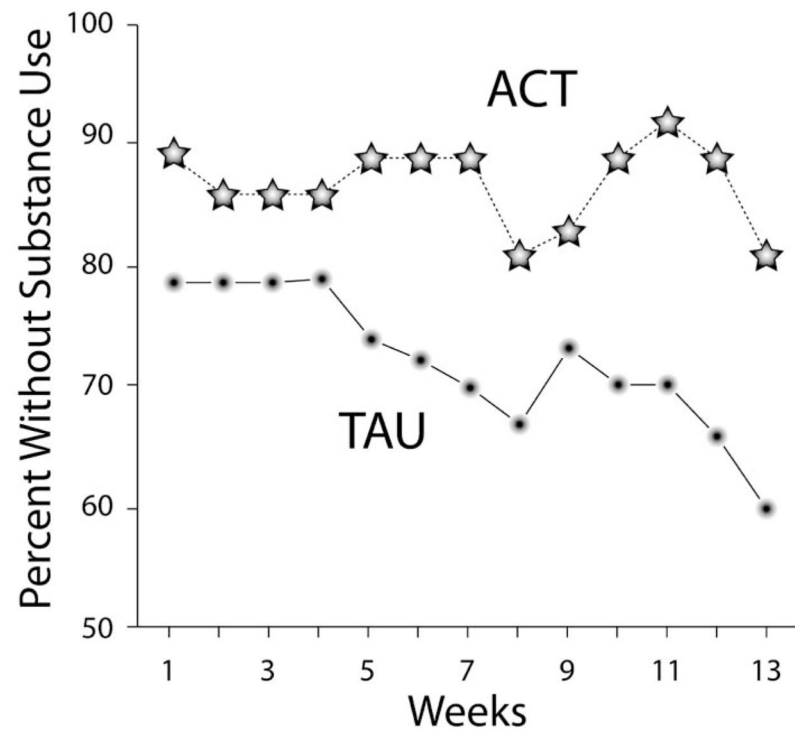
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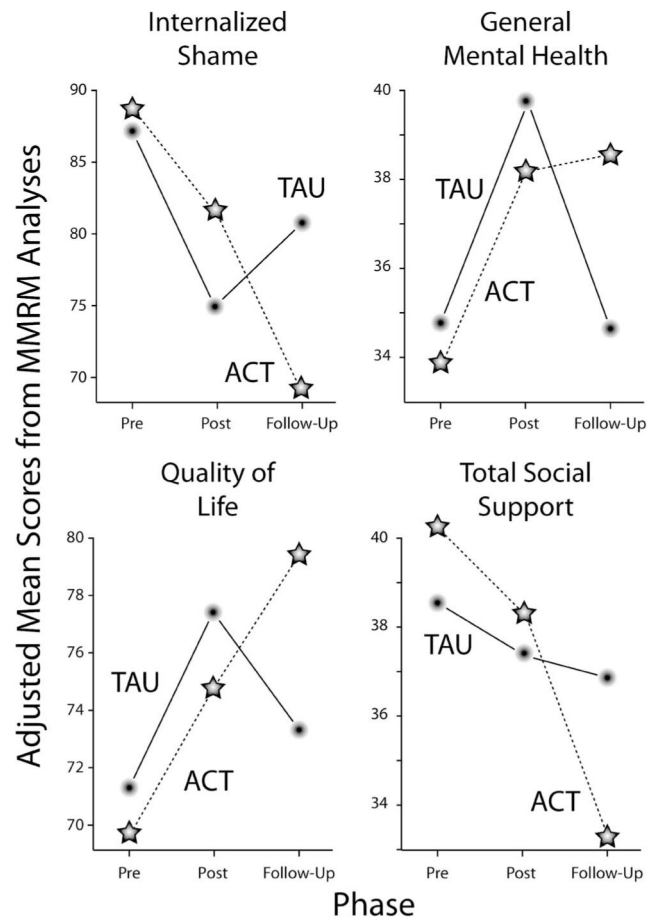


**Figure 1.**  
Participant flow through study. ACT = acceptance and commitment therapy; TAU = treatment as usual.



**Figure 2.**

Average percentage of participants with substance use-free weeks for each week during follow-up for participants in the treatment as usual condition (TAU) and the acceptance and commitment therapy group plus TAU condition (ACT).



**Figure 3.**

Psychosocial outcomes for internalized shame (Internalized Shame Scale), general mental health (General Health Questionnaire-12), quality of life (Quality of Life Scale), and total social support (Multidimensional Scale of Perceived Social Support) at each measurement occasion for the treatment as usual condition (TAU) and the acceptance and commitment therapy group plus TAU condition (ACT). Values shown are adjusted means derived from the MMRM analyses. Note that the total social support measure is scored so that lower values equal more social support. MMRM = mixed model repeated measures.



**Table 1****Participant Background Information**

| Variable  | ACT ( <i>n</i> = 68)   | TAU ( <i>n</i> = 66)   |
|---|------------------------|------------------------|
| During 30 days prior to admission used any:     |                        |                        |
| Alcohol   | 44% ( <i>n</i> = 28)   | 53% ( <i>n</i> = 33)   |
| Methamphetamines                                | 33% ( <i>n</i> = 22)   | 42% ( <i>n</i> = 27)   |
| Marijuana                                       | 22% ( <i>n</i> = 14)   | 29% ( <i>n</i> = 18)   |
| Other hallucinogens                             | 6% ( <i>n</i> = 4)     | 8% ( <i>n</i> = 5)     |
| Inhalants                                       | 2% ( <i>n</i> = 1)     | 2% ( <i>n</i> = 1)     |
| Cocaine   | 8% ( <i>n</i> = 5)     | 22% ( <i>n</i> = 14)   |
| Heroin  | 3% ( <i>n</i> = 2)     | 2% ( <i>n</i> = 1)     |
| Other opiates                                   | 3% ( <i>n</i> = 2)     | 11% ( <i>n</i> = 7)    |
| Methadone                                       | 2% ( <i>n</i> = 1)     | 2% ( <i>n</i> = 1)     |
| Tobacco   | 60% ( <i>n</i> = 31)   | 55% ( <i>n</i> = 33)   |
| During 30 days prior to admission:              |                        |                        |
| Had unprotected sex                             | 45% ( <i>n</i> = 30)   | 49% ( <i>n</i> = 32)   |
| Drinking and driving                            | 26% ( <i>n</i> = 17)   | 24% ( <i>n</i> = 16)   |
| Shared drug paraphernalia                       | 27% ( <i>n</i> = 18)   | 12% ( <i>n</i> = 8)    |
| Had serious thoughts of suicide                 | 19% ( <i>n</i> = 13)   | 13% ( <i>n</i> = 8)    |
| Attempted suicide                               | 7% ( <i>n</i> = 5)     | 2% ( <i>n</i> = 1)     |
| Number of previous treatments in lifetime       | 2.8 ( <i>SD</i> = 3.5) | 1.4 ( <i>SD</i> = 2.0) |
| Taking psychiatric medication                   | 31% ( <i>n</i> = 21)   | 26% ( <i>n</i> = 17)   |
| Completed at least high school                  | 67% ( <i>n</i> = 51)   | 64% ( <i>n</i> = 26)   |
| Completed at least some college                 | 25% ( <i>n</i> = 13)   | 23% ( <i>n</i> = 7)    |
| Employed  | 15% ( <i>n</i> = 9)    | 15% ( <i>n</i> = 10)   |
| On probation/parole, on bail, or awaiting trial | 57% ( <i>n</i> = 37)   | 57% ( <i>n</i> = 36)   |

*Note.* Percentages were calculated based on percent of complete data. ACT = acceptance and commitment therapy; TAU = treatment as usual.

Table 2

Means for All Outcome Measures Across All Measurement Occasions

| Measure                             | Treatment as usual |                |                     | Treatment as usual plus ACT |                |                     |
|-------------------------------------|--------------------|----------------|---------------------|-----------------------------|----------------|---------------------|
|                                     | Pre<br>M (SD)      | Post<br>M (SD) | Follow-up<br>M (SD) | Pre<br>M (SD)               | Post<br>M (SD) | Follow-up<br>M (SD) |
| Mental health (GHQ)                 | 34.18 (8.34)       | 39.81 (6.66)   | 34.78 (8.29)        | 33.78 (7.13)                | 37.90 (6.74)   | 37.41 (7.42)        |
| Quality of life (QLS)               | 69.65 (20.37)      | 76.72 (15.66)  | 73.98 (18.68)       | 69.51 (16.33)               | 74.23 (14.80)  | 78.14 (13.20)       |
| Shame (ISS)                         | 86.78 (26.69)      | 74.97 (30.27)  | 80.54 (31.28)       | 88.14 (25.43)               | 83.31 (21.76)  | 71.64 (24.12)       |
| Social support (MSPSS) <sup>a</sup> | 38.54 (16.03)      | 37.33 (10.69)  | 36.69 (16.56)       | 40.28 (15.88)               | 38.78 (11.85)  | 33.97 (15.81)       |
| Treatment use (TSR)                 |                    |                | 10.68 (13.90)       |                             |                | 19.00 (16.03)       |

Note. ACT = acceptance and commitment therapy; GHQ = General Health Questionnaire-12; QLS = Quality of Life Scale; ISS = Internalized Shame Scale; MSPSS = Multidimensional Scale of Perceived Social Support; TSR = Treatment Services Review.

<sup>a</sup>Keyed so that lower numbers equal higher support.

Table 3

## Results for Primary Mediation Analyses

| Mediator/outcome   | Path        | Normal theory tests |      |       |      | Bootstrapped results for indirect effects (BCa 95% CI) |       |       |
|--|-------------|---------------------|------|-------|------|--|-------|-------|
|  |             | Coefficient         | SE   | t     | p    | Point estimate (SE)                                    | Lower | Upper |
| Follow-up treatment use (TSR) as a mediator of follow-up weeks of use              | a           | 7.95                | 3.59 | 2.21  | .030 |  |       |       |
|  | b           | -0.06               | 0.03 | -1.98 | .052 |  |       |       |
|  | Total (c)   | -1.95               | 0.94 | -2.08 | .041 |  |       |       |
|  | Direct (c') | -1.47               | 0.95 | -1.55 | .127 |  |       |       |
|  | a × b       | -0.48               | 0.32 | -1.49 | .136 | -0.47 (0.28)   | -1.28 | -0.08 |
| Follow-up weeks of use as a mediator of follow-up treatment use (TSR)              | a           | -1.95               | 0.94 | -2.08 | .041 |  |       |       |
|  | b           | -0.88               | 0.44 | -1.98 | .052 |  |       |       |
|  | Total (c)   | 7.95                | 3.59 | 2.22  | .03  |  |       |       |
|  | Direct (c') | 6.24                | 3.62 | 1.72  | .09  |  |       |       |
|  | a × b       | 1.72                | 1.19 | 1.45  | .147 | 1.75 (1.10)  | 0.15  | 4.68  |
| Posttreatment levels of shame (ISS) as a mediator of follow-up treatment use (TSR) | a           | 13.22               | 6.47 | 2.04  | .045 |  |       |       |
|  | b           | 0.14                | 0.07 | 1.97  | .053 |  |       |       |
|  | Total (c)   | 7.59                | 3.73 | 2.03  | .046 |  |       |       |
|  | Direct (c') | 5.78                | 3.77 | 1.53  | .130 |  |       |       |
|  | a × b       | 1.81                | 1.26 | 1.43  | .152 | 1.73 (1.35)  | 0.01  | 5.54  |

Note. BCa = bias corrected and accelerated; CI = confidence interval; ISS = Internalized Shame Scale; TSR = Treatment Services Review.