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Feasibility, Acceptability, and Impact of a Web-based Gratitude Exercise among Individuals in Outpatient Treatment for Alcohol Use Disorder

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Abstract

This mixed-methods pilot study examined the feasibility, acceptability, and impact of a web-based gratitude exercise (the 'Three Good Things' exercise (TGT)) among 23 adults in outpatient treatment for alcohol use disorder (AUD). Participants were randomized to TGT or a placebo condition. The intervention was feasible with high rates of completion. Participants found TGT acceptable and welcomed the structure of daily emails; however, they found it difficult at times and discontinued TGT when the study ended. Participants associated TGT with gratitude, although there were no observed changes in grateful disposition over time. TGT had a significant effect on decreasing negative affect and increasing unactivated (e.g., feeling calm, at ease) positive affect, although there were no differences between groups at the 8 week follow up. Qualitative results converged on quantitative findings that TGT was convenient, feasible, and acceptable, and additionally suggested that TGT was beneficial for engendering positive cognitions and reinforcing recovery.

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Keywords

Alcohol use disorder; Web-based intervention; Positive and negative affect; Gratitude; Three Good Things exercise

Anecdotal evidence suggests that there is a strong association between gratitude and recovery in 12 step programs (AA World Services, 2002a; Wilson, 1967). Alcoholics Anonymous (AA) literature recommends expressing "genuine gratitude for blessings received" as part of its 10th step (AA World Services, 2002b, p. 95) and making a "gratitude list" is a common recommendation passed down from sponsor to sponsored. The field of positive psychology has tested positive interventions, that is, "treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (Sin & Lyubomirsky, 2009, p. 468), and two meta analyses have reported small (Bolier et al., 2013) and medium (Sin & Lyubomirsky, 2009) effect sizes for their beneficial influence on well-being and depression. One popular positive psychology intervention, the Three Good Things exercise (TGT), asks individuals to write about three good things that happened in a day and why they happened (Seligman, Steen, Park, & Peterson, 2005). To our knowledge, no previous study has tested the effects of an intervention focusing primarily on gratitude among individuals with an alcohol use disorder (AUD). Therefore, the current investigation is a pilot study that employs mixed methods to examine the acceptability, feasibility, and impact of TGT for individuals in outpatient treatment for AUD.

The design and measurement protocol of this study was guided by the Broaden and Build theory of positive emotion, which posits that increases in positive affect foster expansion in psychosocial resources that bring about increases in global well-being (Fredrickson, 2001; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Therefore, as a first step, the quantitative analyses in this study focus on affect as the primary dependent variable. TGT has been shown to have a beneficial impact on affect; in randomized controlled trials involving non-clinical samples, TGT increased levels of happiness (Mongrain & Anselmo-Matthews, 2012; Seligman et al., 2005) and decreased levels of depression (Seligman et al., 2005). Borrowing the Broaden and Build lens to view addiction recovery, we hypothesize that positive affect may meditate the relationship between positive interventions, such as TGT, and improved drinking outcomes.

Empirical evidence to support this hypothesis is only now emerging as positive psychology's application to addictions is in the earliest stages (Krentzman, 2013). Recent cross-sectional studies have begun to examine positive affect as a protective factor in addictions. In a sample of 1,375 individuals entering treatment for AUD, McHugh and colleagues (2013) found that positive affect moderated the relationship between stress and negative affect, but did not moderate the relationship between stress and craving. Carrico and colleagues (2013) explored the protective function of positive affect in a cross-sectional sample of 88 men who used methamphetamine. They found that positive affect had an indirect effect on reducing substance use via recovery-enhancing mediators, such as self-efficacy, abstinence-related action tendencies, and abstinence-specific social support.

To date, only small pilot studies have tested the effects of positive interventions among individuals with addictions. These studies have included gratitude practices as one component of a multifaceted positive intervention and have targeted affect as a primary outcome. Akhtar and Boniwell (2010) tested an 8-week positive intervention group for 10 adolescents with alcohol problems and compared results to 10 similar teens at the same social service agency. Post-intervention there were no differences between the treatment and control groups in negative affect or alcohol indicators, but the experimental group outperformed the control group on measures of happiness, optimism, and positive affect. Carrico and colleagues (under review) randomized 18 methamphetamine users into a five-session intervention designed to induce positive affect (n=8) or a control condition (n=10). Qualitative data indicated high levels of acceptability of the intervention, however, quantitative results were mixed--no changes in affect were observed for either group immediately post intervention or at the 6 month follow up; but at the 2 month follow up, the treatment group experienced significant increases in positive affect and the control group experienced significant decreases in negative affect.

Scholars advise taking a multidimensional approach to the study of affect (Cohen & Pressman, 2006) and they have specifically hypothesized that *unactivated* dimensions of positive affect (e.g., feeling calm, at ease, relaxed) might be of more utility to individuals seeking addiction recovery than *activated* positive affect (e.g., feeling excited, active, enthusiastic), which might be more associated with the hedonic features of drinking and drug use (Carrico et al., 2013). Previous work on positive affect and addictions has tended to employ a single dimension of the construct (Akhtar & Boniwell, 2010; Kahler et al., 2014; McHugh et al., 2013). To our knowledge, this study is the first to determine preliminary results of the effect of TGT on negative affect (NA), *activated* positive affect (APA), and *unactivated* positive affect (UPA).

This study analyzes qualitative and quantitative data in order to answer the following questions:

1. Was TGT, and its web-based delivery, acceptable to individuals with AUD?
2. Was TGT, and its web-based delivery, feasible among individuals with AUD?
3. What was the impact of TGT on individuals with AUD?

Method

Participants

The recruitment site was an outpatient substance use disorder treatment program in the Midwestern U.S. Inclusion criteria included alcohol as the primary addictive substance, minimum 18 years of age, internet access, and active status at the treatment center. Enrollment in treatment was defined as receiving individual or group psychotherapy, medication management, or a combination of these modalities. Exclusion criteria included individuals with severe cognitive deficits, untreated psychiatric illness (such as psychotic or bipolar disorders), current suicidal or homicidal ideation, and personality disorders likely to

interfere with study participation. Diagnosis of a DSM-IV AUD was confirmed with each patient's master's-level primary therapist and by chart review.

Prospective participants were identified via medical record and approached by research staff, invited through their primary clinician, or they contacted researchers via recruitment flyers. Twenty-eight individuals were screened; 23 were eligible (82.1%). All eligible patients were enrolled and all completed with the exception of one person who dropped out after four days.

The majority of participants (n=19, 82.6%) were in individual therapy, ten (43.5%) were in group therapy, and 11 (47.8%) were seeing an addiction psychiatrist for medication management. Fourteen (60.9%) attended a combination of these treatment modalities. Time in treatment ranged from two weeks to just over five years and, at baseline, days since last substance use ranged from 15–1,855 days (M=430.6, SD= 520.4). This wide distribution is in keeping with the recruitment site, which offers services to individuals in all stages of recovery. The sample was an average of 46.3 (SD=10.9) years old with an average education level of 16.2 (SD=3.0) years. Eleven participants were female (47.8%). Nine were European-American (81.8%). Approximately half were married or cohabitating with a significant other (n=11, 47.8%) and just over half were employed full time (n=13, 56.5%). Overall at baseline, participation in AA was high, levels of disposition toward being grateful were on par with non-clinical samples (McCullough, n.d.), and levels of depression, anxiety, alcohol craving, and drinking consequences were relatively low.

Design

The design was a mixed methods randomized controlled pilot of a 14-day intervention with two follow-up assessments 8 and 14 weeks after baseline. A paired-randomization strategy ensured an equal number of participants in both groups. Groups were equivalent on all baseline criteria (see Table 1). The TGT group answered the questions on the left of Table 2, the placebo control group answered the questions on the right of Table 2. Placebo questions were hypothesized to have no effect on affect. This study employed mixed methods for the purpose of complementarity; that is, "to measure overlapping but also different facets of a phenomenon" with the intention of producing "an enriched, elaborated understanding of the phenomenon" (Greene, Caracelli, & Graham, 1989, p. 258).

Quantitative Measures

Feasibility and acceptability—Feasibility was assessed by rates of participant attrition and percentage of participants who completed each wave. Acceptability was assessed with individual items measuring the degree to which participants found the exercises satisfying, pleasant, helpful, and easy using an 11 point response format ranging from 0=*not at all* to 10=*extremely*.

Affect was assessed immediately after the questions in Table 2 for each of the 14 days of the intervention and at the 8 week follow up. Affect was measured with three distinct subscales of the Positive and Negative Affect Schedule-Expanded Form (PANAS-X) (Watson & Clark, 1994): Activated positive affect (APA) was measured by the positive affect subscale,

negative affect (NA) by the negative affect subscale, and unactivated positive affect (UPA) by the serenity subscale. Ten items assessed APA (e.g., active, alert, enthusiastic) and ten items assessed NA (e.g., afraid, hostile, distressed), and three items assessed UPA (calm, at ease, relaxed). Participants were asked the degree to which they felt each feeling 'right now, in the present moment.' A 5-point Likert-type response format measured the range from 1=*very slightly or not at all* to 5=*extremely*. (α = .94, .88, and .79, for APA, NA, and UPA, respectively).

Grateful Disposition—A tendency to respond to positive circumstances with a feeling of gratitude was assessed at baseline, day 7, day 14, and at the 8 week follow up with the Gratitude Questionnaire-Six Item Form (GQ-6) (McCullough, Emmons, & Tsang, 2002). The instrument employs six items and uses a 7 point Likert-Type response format from 1=*strongly disagree* to 7=*strongly agree*. (α = .91).

Qualitative Interview and Survey

Qualitative data were collected via two methods: a web-based, post-intervention open-ended survey on day 14 (completed by all participants in the TGT condition (n=11, 100%)) and an in-depth interview, which took place on average 14 weeks (SD=5.3) after baseline (completed by the majority of participants in the TGT condition (n=8, 72.7%)). The web survey asked about the experience of being in the study and practicing TGT, such as how the experience was different from what they usually do, what they liked and disliked about being in the study, any difficulties encountered, suggestions for improvement, and whether they might continue TGT on their own. The in-depth interviews asked participants whether TGT had an effect on their thoughts, feelings, or behaviors; what they learned about themselves; to describe their experience of the web-based delivery of the surveys; and what they found easy or difficult, satisfying or unsatisfying, and enjoyable or unenjoyable.

Procedure

Informed consent was obtained and the baseline assessment were completed via a face-to-face meeting in early 2013. Participants began receiving daily emailed surveys the next morning, which continued for 14 days. Exercises and assessments were administered via web survey (Qualtrics, L.L.C.). Follow-up interviews with TGT participants were conducted by the first author; five took place during face-to-face meetings in our research offices, three took place via telephone. Interviews lasted an average of 37.6 (SD=11.6) minutes and were audio-recorded.

Study participants were compensated $25 for baseline, $2 for daily, and $10 for day 7, day 14, and week 8 surveys. In addition, participants were paid a $10 bonus for completing at least 80% of the surveys between day 1 and the 8 week follow up and $25 for the follow-up interview. The study was approved by the appropriate Institutional Review Boards. See Table 3 for a visual depiction of the study design and assessment schedule.

Quantitative Data Analysis

Descriptive statistics characterized feasibility and acceptability. Student's t tests, chi square analyses and Fisher's Exact Tests assessed differences between groups.

Multi-level modeling as described by Singer and Willett (2003) was used to investigate the effect of TGT on NA, APA, UPA, and gratitude, over the course of the intervention period. First, an unconditional means model was run. Next, an unconditional growth model was used to add the dimension of time to the previous model. Finally, a conditional growth model was run to include time, treatment condition, and their interaction in order to test the effect of treatment condition on the trajectory of change. Restricted Maximum Likelihood (REML) was the method of estimation. Student's t tests assessed differences between groups at the 8 week follow up. Corrections for multiple tests were not employed in this small pilot study.

Qualitative Data Processing and Analysis

Interviews were transcribed verbatim. Paralinguistic cues (e.g., sighs, laughter) were not transcribed but initial coding was conducted while listening to the audio recording and reading the transcript concurrently to capture meaning conveyed non-verbally. NVivo version 10 was employed for the qualitative analyses. We began by identifying content relevant to participants' perceptions of feasibility, acceptability, and impact in the transcripts and written responses. We defined *feasibility* as the degree to which participants found the TGT to be doable or undoable and hard or easy; *acceptability* as the degree to which participants found TGT to be enjoyable or unenjoyable, agreeable or disagreeable; and *impact* as the effect TGT had on participants. Next, we employed the thematic data analytic techniques recommended by Braun and Clarke (2006), including reading and re-reading the transcripts and written responses, generating preliminary codes, organizing codes into themes, refining and defining themes, and continually comparing emerging results with the research questions and original data to ensure accuracy of our interpretation.

Results

Feasibility of TGT

Out of 23 participants over 14 days, a mean of 21.0 (SD=1.1) individuals participated in each daily wave (91.3%). Participants completed an average of 12.8 (SD=2.4) of the 14 daily reports (91.4%). The control group found its exercise easier than the TGT group with means of 8.5 versus 6.3, respectively ($t(20) = -2.30$, $p<.05$) (Figure 1).

The qualitative data on feasibility supported three primary themes.

1. TGT was harder for some participants than others—Participants varied in how difficult they found TGT. Five participants could not think of three good things that happened in a day on at least one occasion. One person wrote in the survey: "*There were days when I went, 'One and that's it.' There were days when I struggled. It's like, 'Okay, this—but that's a stretch*.'" In contrast, another participant indicated that: "*It was really cool to be able to really quickly think of three positive things. I didn't have to sit very long and think about it*."

Many participants reported that while the practice was hard at first, it got easier, either within the span of a single session or after several days of practice: "*At times I was disheartened because nothing came to mind. But then with further thought I could always*

come up with something good….” Those who could not think of TGT each day had lower levels of education than those who could (13.6 versus 18.5 years, (t(6.6) = 2.78, p<.05).

2. TGT was harder on some days than others—Participants described that the practice was harder when they felt tired, were physically ill, or were going through a difficult life transition. On such days, coming up with three good things required more effort, but it was still possible to notice good things even in the midst of a challenge: “*[On] days when I wasn’t feeling real good it made it hard to come up with three things…. It made me have an effort to see some good out of today*.” One participant going through a major life transition described having

> *… difficulty in answering those when it came to, ‘what are three good things that have happened.’ It was like, ‘Okay, find the positive through all of this….’ I think I did still come up with the three requirements. I’m like, ‘I still have this. I’m still grateful for this….’ I mean it’s not like everything was going bad*.

3. Web based delivery was convenient—Participants found the web-based delivery of TGT to be straightforward, easy, and not “*hard to follow*.” Some stressed the convenience of receiving the survey via email and replying electronically: “*I’d get out the iPad and just click click click … before I went to bed*.”

Acceptability of TGT

In the quantitative analyses, treatment and control groups found the exercises equivalently satisfying, pleasant, and helpful (see Figure 1). The qualitative data supported three primary themes.

1. TGTs were likeable, but sometimes a chore—Overall, participants experienced TGT as enjoyable, fun, and a “*positive experience*.” There were times, however, when the experience felt like a chore or an additional demand on time:

> *There were some nights when … I had just crawled into bed and I’m like, ‘Oh crap. I forgot to do it.’ And I’d just rush to get it done but most nights it was nice to do it because it would give you an opportunity to sit and reflect and think about the good things*.

2. Structure, reminders, accountability—Some participants liked the structure of receiving the morning emails and the 9 pm reminder. One participant stated, “*Without the reminders I would not have been able to stay on top of it*.” Another felt that for the TGT to succeed as a formal treatment component, there would need “*to be a daily reminder, a daily encouragement*.” One participant indicated she used electronic reminders even for spiritual practices:

> *I work better with deadlines … even with good daily practices, like writing a gratitude list…. I do that even with prayer right now. I have a reminder on my phone that goes off at the same time every day*.

Being in a research study added a layer of accountability that would be absent from independent practice. Knowing that their answers were going to be read and analyzed

inspired some to work harder and complete each day's TGT because, "*I knew someone was counting on me doing it*" and therefore put "*effort into it that I might not have if it was just for myself*." For many, meeting study requirements led to a feeling of accomplishment and therefore provided an additional form of positive reinforcement.

When the daily surveys ended, the structure, reminders, and requirements ended as well. We did not explicitly recommend continued practice of TGT, but on Day 14 we asked, "Do you think you may continue to do the three good things exercise on your own after we stop sending you links to the daily surveys?" Six participants said yes, three said maybe (together, 81.8%), and one wrote probably not: "*It is just my ADHD-like nature to be interested in something when it is new, but then not follow through or have it not become a structured part of my day—even if it is good for me*."

During the in-depth interviews 14 weeks after baseline, participants were asked whether they continued to practice TGT. Only one person reported he continued to write down TGT on a daily basis while another stated that she did not think of TGT anymore at all. Others kept the practice in mind without writing down their TGTs: "*If there was something that led me to be positive or think about something I was grateful for, then I was probably more inclined to stop and say, 'okay, hey, three things.'*"

3. Entering responses into the computer was acceptable—Participants reported no problem entering responses into a computer. "*I didn't hold back anything*." Some were motivated by the idea of helping others: "*If I can do anything to help you as researchers, help others get well, then I'm happy to do that. I've got no problem being painfully honest and recording it for the good of all*."

Impact of TGT

The quantitative and qualitative data together provided support for TGT having impact on gratitude, affect, cognition, and recovery.

Impact of TGT on gratitude—At its most basic level, TGT prompted participants to stop and think about "*positive things*" as well as to reflect on these things, which led to a deeper appreciation of them. Thus, appreciation was engendered for "*things that I just took for granted*," things that "*have always been there*," "*small everyday things in my life that I have been overlooking*," "*common things*," "*little things*," and even "*something simple, like the fact that I wake up and it's a nice day*." Although the TGT instructions do not explicitly mention gratitude, the majority of participants linked TGT to gratitude. One participant discovered that "*thinking of positive things would trigger gratitude*."

The multi-level model of grateful disposition, however, depicted no difference between the TGT and control groups over time. The group by time interaction was not significant and mean gratitude did not change significantly over time for the treatment or control group; there were no differences between groups on this outcome at the 8 week follow-up (See Tables 1 and 4).

Impact of TGT on affect—Participants described TGT as having a beneficial impact on affect. Participants sometimes qualified their responses ("*not always*" and "*I can't say it was absolutely that*"), but nonetheless used words such as optimistic, proud, good, happy, better, lighter, motivated, hopeful, and more positive to describe the effect of TGT: "*You could say it gave me a pick me up*." One participant described the way in which TGT led to pride and positive affect:

> *When there was something that I really liked and was grateful for … I really enjoyed getting that down because I felt proud of that. I felt proud that I was grateful about that. It was something that I felt good about and it further reinforced the good feeling*.

The multi-level models also indicated improvement in affect. According to the conditional growth model of NA, change in the treatment and control groups were not significantly different from each other. However, mean NA in the TGT group decreased significantly (β= −.29, p=.028) while mean NA for the control group did not change (β = .00, p=.989). Thus, for each day, NA decreased for the TGT condition by .29 points. Over 14 days, this corresponded to a decrease of 3.8 points (52% of a standard deviation).

For UPA, the interaction between group and time was statistically significant (p=.007) indicating that TGT and control slopes were different from each other (see Figure 2). Mean UPA increased significantly in the TGT group (β=.08, p=.043) while in the control group, mean UPA decreased with a p value which approached significance (β = −.07, p=.067). For each day, the treatment group increased .08 of a point. Over 14 days, this corresponded to an increase in 1 point (40% of a standard deviation). For PA, the interaction between group and time was not significant and neither the TGT or control group changed significantly over time. Differences between groups at the 8 week follow up were not statistically significant for APA, NA, or UPA.

Impact of TGT on cognition—Several participants described a predominance of negative thinking: "*I have a tendency to focus on the negative*" and "*I'm not real positive about myself … It's easier for me to spot the negative than spot the positive*." In the interview, one participant described the long-standing nature of his way of thinking:

> *This is something that I've suffered with throughout my life and especially through alcoholism, active and recovering, is seeing the negative in everything … the world's against me all the time. And I've been that way since as far back as I can remember. In any opportunity, I always think the bad thing's going to happen and not the good thing*.

Several participants described how TGT disrupted such negative thinking:

> *To look for something positive every day takes me out of the negative thinking about the world. I'm not looking around and thinking everything is screwed up and all I caused. Looking for a sunny day and appreciating it instead of a cloudy day and I caused it. It just keeps my head in another place*.

Several participants reported taking special notice of good things as they occurred throughout the day, in order to recall them for the survey that night. Noticing good things as

they occurred throughout the day in and of itself brightened the cognitive perspective of some participants:

> *Knowing that I had to do [TGT] made me aware of the fact of keeping an eye out, like, 'Oh, that can go on my list.' So the fact that I had to do it made me on the lookout for it during the day. Which, again, if it's in your mind to be grateful for things or look for things to be grateful for then it's going to happen more often than seeing the negative*.

Some theorized about links between noticing good things, improving one's cognitive outlook, feeling gratitude, and how these processes can protect against negative thoughts. Noticing good things would "*jumpstart you into a better mindset*." This improved mindset would foster gratitude: "*it's hard to be grateful for something when you are in a negative place*." And then gratitude could be leveraged to dismantle negative thoughts, especially with practice:

> *If gratitude is on the forefront of your mind, you can shift the bad and at least try to see what's good in it but it doesn't happen automatically unless you're in the habit of seeing things that way*.

Impact of TGT on recovery—TGT includes the question, "What made that good thing happen?" (see Table 2). In reply, many participants credited their sobriety: "*I always felt like I was falling back on, 'Well, because I'm in recovery' … that was pretty much the answer every time*." Other participants described specific ways that TGT reinforced recovery. One participant described how TGT furthered improvements in positive thought that came as the result of AA. Another participant who had been marking his sober time in months found that with TGT he gave himself credit for each sober day: "O*pposed to thinking, 'it's been six months,' or, 'it's been nine months.' … thinking about it every day … made me appreciate it more*." Another participant saw good things as the fruits of the hard work necessary for recovery. In this way, TGT "*…helps you realize why you're in recovery and working so hard. It takes a lot of hard work. It can be very draining*." This same participant found that recognizing good things was helpful as "… *a great reminder, especially in times when you felt down or like relapsing*."

While this study was not designed to test the effect of TGT on drinking, two individuals in the treatment group and one individual in the control group drank between baseline and the 8 week follow-up.

Discussion

The findings from this study indicate that the daily practice of the Three Good Things exercise was both feasible and acceptable in a sample of individuals in outpatient treatment for alcohol use disorder. Qualitative and quantitative data suggested that TGT has potential to favorably impact affect, cognition, and recovery.

Pending replication of these results with larger samples, the results of this study suggest preliminary recommendations for the clinical use of TGT among individuals with addictions. First, TGT can be very difficult for some participants, with some unable to think

of three good things in a day. Whether this is due to lower levels of education, as found here, or other factors is an important question for future study. Second, participants participated regularly and consistently in part because of the structure and positive reinforcement that came from daily reminders and being in a research study. Clinicians recommending TGT might consider providing structure along with other positive reinforcements to encourage regular practice, and might consider strategies for facilitating the practice among participants who find the task difficult, perhaps by coaching individuals to be mindful of even “small” good things. Clients who have difficulty expressing themselves in writing might be invited to phone in their TGTs or share them verbally with a friend or family member.

The results of this study suggest implications for further research. While the word “gratitude” is not part of TGT instructions, the majority of participants associated the task with gratitude. However, neither the treatment nor the control groups changed in levels of grateful disposition over time. Whether regular practice of TGT might increase grateful disposition with time remains an open question; fully powered replication of the current study should test this hypothesis.

TGT boosted unactivated positive affect, but had no effect on activated positive affect. Previous work on the significant association between emotional arousal and both alcohol consumption and problems (Cyders et al., 2010; Shishido, Gaher, & Simons, 2013) may suggest a more problematic role for activated positive affect and a more protective role for unactivated positive affect (Carrico, 2014; Carrico et al., 2013). Future work can further discern the roles of both forms of positive affect on addiction recovery efforts.

Change over time in the current study was detected by measuring affect on a daily basis, immediately following the intervention. Affect is a highly variable construct such that a daily approach might capture trends in data that fail to register using pre- and post-assessments. Future work might consider daily measurement of affect and analysis of trends in these data over time.

Qualitative data additionally identified positive impact of TGT on cognition and recovery. The wide-ranging impact may help explain the strong association between gratitude and recovery in 12 step groups. Further research should consider quantitative assessment of outcomes related to changes in cognition and recovery as well as affect.

A strength of the study was the use of an active control group. Use of a placebo rather than a treatment-as-usual comparison allowed us to control for factors related to completing a daily survey to answer questions about health, reflecting over the past 24 hours, activating expectancies for success, and allowing equivalent compensation schedules for similar activities. This strategy reduced the potential for these factors to function as confounders. Active elements of a control group could be responsible for subsequent improvement, narrowing differences observed between groups (Shadish, 2011). The primary purpose of pilot studies is to ascertain feasibility (Thabane et al., 2010) and therefore it is ill advised to focus on statistical significance or the potential to generate power calculations (Kraemer, Mintz, Noda, Tinklenberg, & Yesavage, 2006). However, it is noteworthy that change in NA

and UPA were statistically significant in the predicted direction. Overall, these results encourage larger investigations of the impact of TGT among individuals with addictions.

Limitations

The sample was comprised of individuals with a wide range of time since last substance use, which limited the ability to assess the effects of TGT on drinking, as several participants entered the study with long-term stable recovery. Future work should recruit individuals who are closer to their last drink to ascertain the effect of TGT on drinking. Larger samples can also comprehensively test the Broaden and Build theory, which this pilot could not. The sample was comprised of highly-educated, employed individuals who had daily access to the internet. Testing TGT among more diverse samples is imperative, as well as testing TGT among individuals without computer access. We found that those who could not think of three good things in a day had lower levels of education than those who could. It is important to remember that interventions that involve writing will pose a challenge for some clients, and accommodations should be provided. Generalization of these results should be undertaken with caution because of the size and nature of the sample.

Conclusion

Results of the study suggest that exercises supporting the practice of regular, intentional focus on what was good in a day are feasible and acceptable among individuals with AUD, and yielded preliminary evidence of positive effect on affect, cognition, and reinforced recovery. Our results encourage further research on the utility of gratitude exercises as a low-cost, easy-to-administer adjunct to treatment (Layous, Chancellor, Lyubomirsky, Wang, & Doraiswamy, 2011). However, structure and positive reinforcement may be necessary to achieve high levels of participation and its associated benefits.

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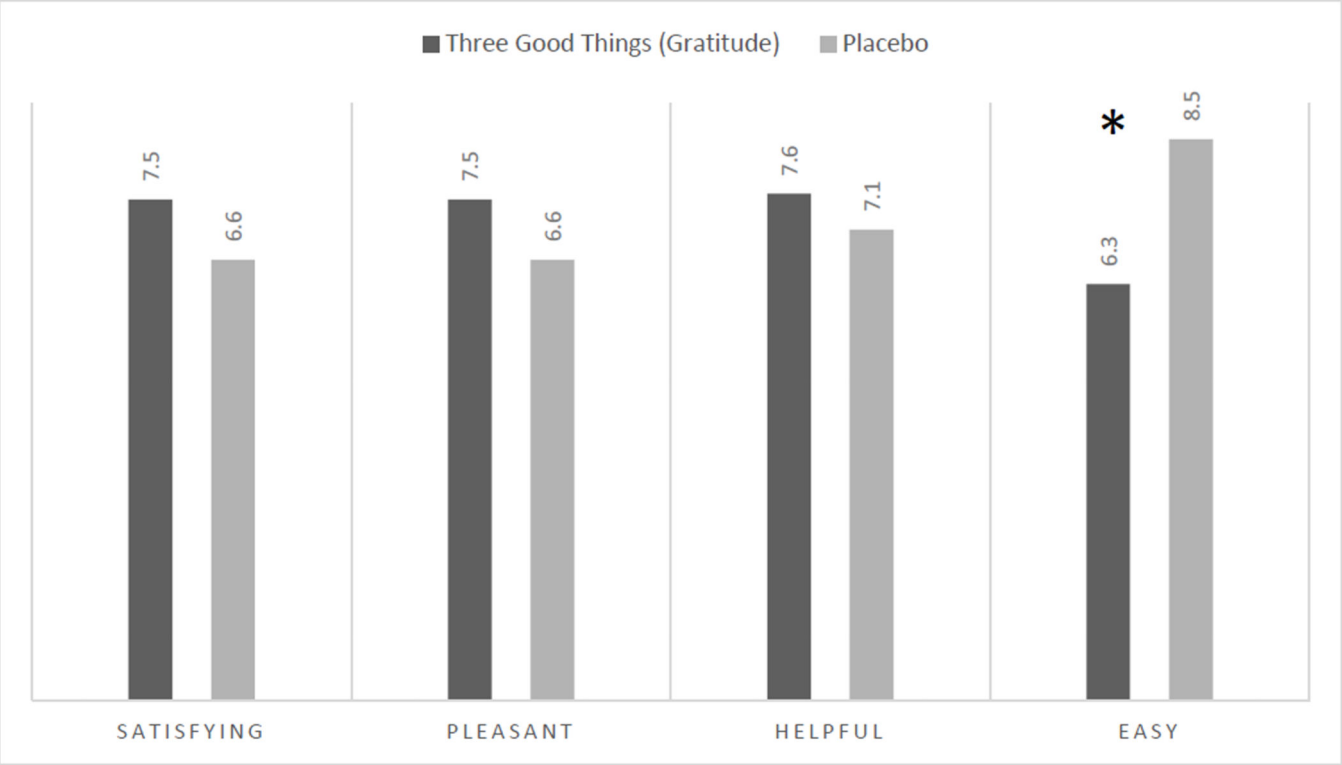

Figure 1. Acceptability Indicators

*p<.05. These dimensions of acceptability were assessed as part of the day 14 survey. Individual items represented the degree to which participants found the exercises to be satisfying, pleasant, helpful, and easy, using an 11 point response format ranging from 0=*not at all* to 10=*extremely*.

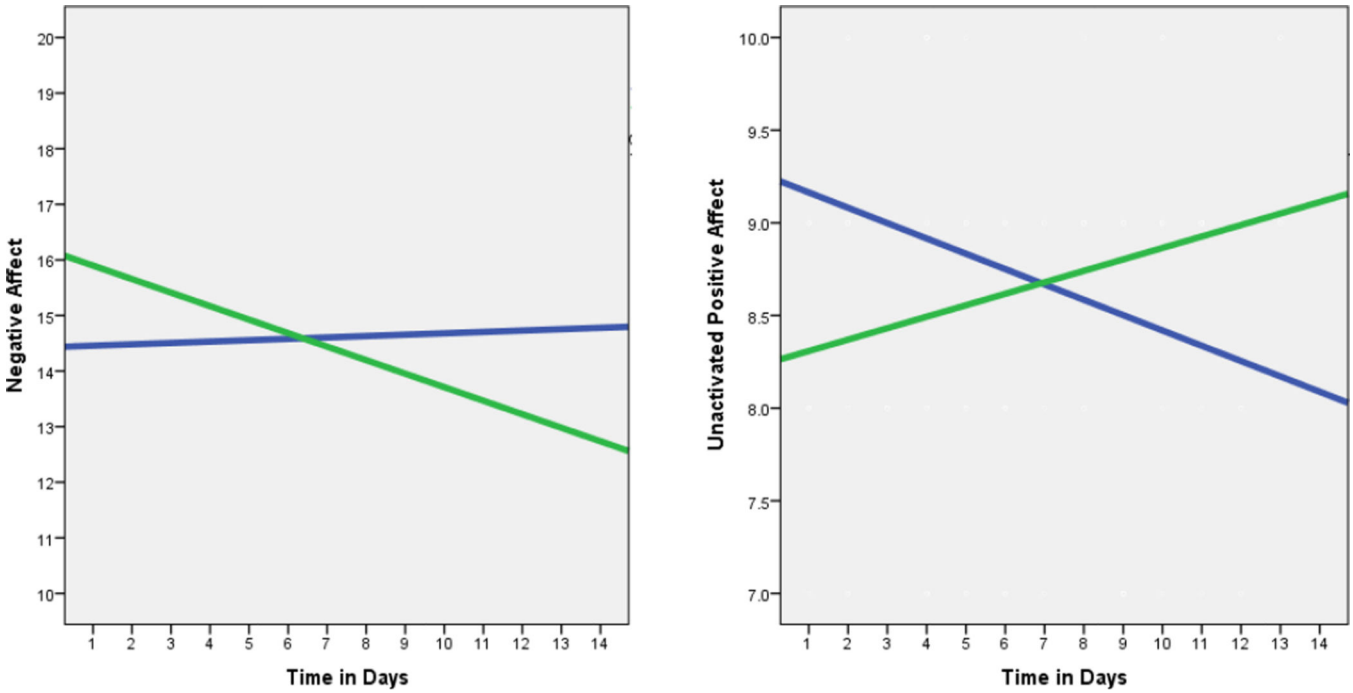

Figure 2. Individuals in the Three Good Things (TGT) Gratitude Group Experienced Significant Reduction in Negative Affect (NA) and Significant Increases in Unactivated Positive Affect (UPA)

= Three Good Things (TGT) Gratitude group

= Control group

The time by group interaction was not significant for Negative Affect (NA, p=.103). Mean NA in the TGT group decreased significantly (β= −.29, *p*=.028) while mean NA for the control group did not change (β = .00, *p*=.989). The time by group interaction was significant for Unactivated Positive Affect (UPA): p=.007. Mean UPA increased significantly in the TGT group (β=.08, *p*=.043) while in the control group, mean UPA decreased with a p value approaching significance (β = −.07, *p*=.067). Graphs depict projected values.

Table 1

Sample Characteristics

			Total Sample		Three Good Things		Placebo	
Variable	**Possible Range**	**Sample Range**	**Mean (Standard Deviation) or Percentage**	**N**	**Mean (Standard Deviation) or Percentage**	**n**	**Mean (Standard Deviation) or Percentage**	**n**
Demographic Characteristics at Baseline								
Age		27–63	46.3 (10.9)	23	44.5 (10.9)	11	47.9 (11.1)	12
Years of Education		12–22	16.2 (3.0)	23	16.3 (3.9)	11	16.1 (2.0)	12
Female			11 (47.8%)	23	4 (36.4%)	11	7 (58.3%)	12
Not European-American			2 (8.7%)	23	2 (18.2%)	11	0 (0%)	12
Married or Co-habitating			11 (47.8%)	23	4 (36.4%)	11	7 (58.3%)	12
Employed Full-Time			13 (56.5%)	23	8 (72.7%)	11	5 (41.7%)	12
Clinical Characteristics at Baseline								
Depression**	0–21	0–13	5.0 (3.9)	23	4.9 (3.9)	11	5.0 (4.1)	12
Anxiety**	0–21	3–18	9.1 (3.7)	23	9.5 (1.6)	11	8.8 (4.9)	12
Craving***	0–56	0–29	10.3 (7.4)	23	10.3 (7.1)	11	10.3 (7.9)	12
Consequences of Drinking****	0–45	0–37	8.3 (11.2)	23	4.9 (9.7)	11	11.5 (12.0)	12
AA Involvement*****	0–9	0–8.8	6.3 (2.6)	23	6.6 (2.6)	11	6.0 (2.7)	12
Days Since Last Substance Use		15–1855	430.6 (520.4)	23	339.5 (343.2)	11	514.2 (647.0)	12
Affect								
Day 1								
Negative Affect (NA)	10–50	10–32	15.0 (6.6)	23	15.7 (7.3)	11	14.5 (6.2)	12
Activated Positive Affect (APA)	10–50	11–47	28.1 (10.1)	23	31.2 (9.8)	11	25.5 (10.0)	12
Unactivated Positive Affect (UPA)	3–15	3–14	9.1 (3.1)	23	8.7 (2.6)	11	9.4 (3.5)	12
Day 14								
Negative Affect (NA)	10–50	10–32	14.1 (5.7)	22	13.4 (3.7)	11	14.8 (7.3)	11
Activated Positive Affect (APA)	10–50	10–41	24.6 (11.5)	22	26.3 (11.2)	11	23.0 (12.1)	11
Unactivated Positive Affect (UPA)	3–15	3–15	8.2 (3.7)	22	8.5 (3.4)	11	7.9 (4.1)	11

			Total Sample		Three Good Things		Placebo	
Variable	**Possible Range**	**Sample Range**	**Mean (Standard Deviation) or Percentage**	**N**	**Mean (Standard Deviation) or Percentage**	**n**	**Mean (Standard Deviation) or Percentage**	**n**
8 Week Follow-Up								
Negative Affect (NA)	10–50	10–33	17.3 (6.4)	22	15.1 (4.6)	11	19.5 (7.3)	11
Activated Positive Affect (APA)	10–50	15–45	32.4 (10.4)	22	35.2 (9.4)	11	29.5 (10.9)	11
Unactivated Positive Affect (UPA)	3–15	4–13	9.1 (3.0)	22	9.4 (3.0)	11	8.8 (3.1)	11
Grateful Disposition								
Baseline	6–42	15–42	35.8 (7.2)	23	36.9 (6.7)	11	34.8 (7.8)	12
Day 7	6–42	17–42	36.1 (7.0)	22	37.0 (7.0)	11	35.2 (7.2)	11
Day 14	6–42	13–42	36.3 (7.6)	22	37.3 (7.1)	11	35.4 (8.4)	11
8 Week Follow-Up	6–42	14–42	36.8 (7.2)	22	38.4 (6.2)	11	35.2 (8.0)	11
Number of Participants who Drank During Study Period *			3 (13.6%)	22	2 (18.2%)	11	1 (9.1%)	11

* Determined at the 8 Week Follow Up, assessed with an electronic version of the Time Line Follow-Back (Pedersen, Grow, Duncan, Neighbors, & Larimer, 2012; Sobell & Sobell, 1992) and with the following individual items: ‘What, if any, was the date of your last drink?’ ‘What, if any, was the date of your last drug use?’

** Assessed via the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983)

*** Assessed by the Obsessive-Compulsive Drinking Scale (OCDS) (Anton, Moak, & Latham, 1995)

**** Assessed by the Short Index of Problems (SIP) (Miller, Tonigan, & Longabaugh, 1995)

***** Assessed via the Alcoholics Anonymous Affiliation Scale (Humphreys, Kaskutas, & Weisner, 1998)

Differences between the treatment and placebo groups were tested for all values reported in this table using t tests, chi square analyses, or Fisher’s Exact tests. No differences between groups were statistically significant.

Table 2

Six Open-ended Questions Administered Daily for 14 Days via Web-based Survey

	Treatment (Three Good Things Exercise) (Seligman et al., 2005)	**Control (Placebo Sleep Hygiene Questions)**
Instructions	Please describe three good things that happened to you in the past 24 hours:	Please describe the nature of your sleep over the past 24 hours:
Question 1	Description of the first good thing that happened in the past 24 hours.	In the past 24 hours, please describe exactly when and where you dozed off, fell asleep, napped, or slept for any length of time.
Question 2	What was its cause? (What made this happen?)	If you engaged in any kind of exercise, including light exercise, in the past 24 hours, what did you do? When during the day did you exercise?
Question 3	Description of the second good thing that happened in the past 24 hours.	During the past 24 hours, what kinds of caffeinated products (coffee, tea, soda, chocolate) did you have, if any, and about how much of each did you have?
Question 4	What was its cause? (What made this happen?)	While you were sleeping at any time over the past 24 hours, was anything on (computers, lights, TV, stereo)? If so, what was on while you were sleeping?
Question 5	Description of the third good thing that happened in the past 24 hours.	Please describe what you were doing in the hour before you last fell asleep.
Question 6	What was its cause? (What made this happen?)	Please describe what you did in the first hour after your final awakening.

Table 3

Study Timeline and Assessment Schedule

	Base-line	Three Good Things Intervention (TGT) or Placebo (P) Administration over 14 Days														Follow-Up	Follow-Up
Week								**1**							**2**	**8**	**14**
Day		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**56**	**98**
Intervention	O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	TGT O	O	O
Control	O	P O	P O	P O	P O	P O	P O	P O	P O	P O	P O	P O	P O	P O	P O	O	
Quantitative																	
GQ-6	G							G							G	G	
PANAS-NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
PANAS-UPA		UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	UPA	
PANAS-APA		APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	APA	
Qualitative															Open-ended survey questions		In-depth inter-views

Notes. O=Observation (an assessment/measurement occasion). TGT=Three good things intervention. P=Placebo exercise. G=administration of the Gratitude Questionnaire-Six Item Form (GQ-6). NA=administration of the Positive and Negative Affect Schedule-Expanded Form, Negative Affect Subscale (PANAS-NA). UPA=administration of the PANAS-Expanded Form, Serenity Subscale (Unactivated Positive Affect). APA=administration of the PANAS-Expanded Form, Positive Affect Subscale (Activated Positive Affect).

Table 4

Results of Conditional Growth Models Predicting Change in Affect During the Intervention Period, Including Time in Days, Condition Assignment (Treatment or Placebo), and Their Interaction.

Outcomes:	**Negative Affect (range 10–50)**					**Activated Positive Affect (range 10–50)**					**Unactivated Positive Affect (range 3–15)**					**Gratitude (range 6–42)**				
Fixed Effects	**Estimate**	**SE**	**df**	**t**	***p* value**	**Estimate**	**SE**	**df**	**t**	***p* value**	**Estimate**	**SE**	**df**	**t**	***p* value**	**Estimate**	**SE**	**df**	**t**	***p* value**
Treatment Intercept	16.55	1.89	20.70	8.76	.000	29.73	2.48	20.63	11.97	.000	8.15	0.90	24.57	9.10	.000	36.88	2.19	22.62	16.81	.000
Placebo Intercept	14.70	1.81	20.72	8.12	.000	23.98	2.38	20.66	10.08	.000	9.17	0.86	24.58	10.70	.000	34.80	2.10	22.66	16.55	.000
Treatment Slope	−0.29	0.12	18.61	−2.39	.028	−0.18	0.19	19.88	−0.94	.357	0.08	0.04	269.21	2.04	.043	0.03	0.06	42.05	0.43	.672
Placebo Slope	0.00	0.12	18.85	0.01	.989	0.04	0.18	19.88	0.23	.824	−0.07	0.04	270.80	−1.84	.067	0.01	0.06	42.30	0.14	.886
Intra-class correlations (ICC)	68.6%					75.3%					68.2%					92.7%				
Are treatment and placebo means significantly different from each other on day 1 (intercept)?					.487					.110					.415					.500
Are treatment and placebo slopes significantly different from each other?					.103					.417					.007					.843
Random Effects	**Parameter Estimate**	**SE**	**Wald Z**		***p* value**	**Parameter Estimate**	**SE**	**Wald Z**		***p* value**	**Parameter Estimate**	**SE**	**Wald Z**		***p* value**	**Parameter Estimate**	**SE**	**Wald Z**		***p* value**
Level 1, Within person variance	9.60	0.86	11.11		.000	23.00	2.07	11.13		.000	3.45	0.30	11.60		.000	9.41	0.85	11.06		.000
Level 2, Between-person variance in initial status	36.64	12.21	3.00		.003	61.61	21.15	2.91		.004	7.88	2.52	3.13		.002	38.23	12.99	2.94		.003
Level 2, between-person variance in slope	0.12	0.05	2.19		.028	0.27	0.12	2.24		.025	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Level 2, between-person covariance between intercept and slope	−1.10	0.65	−1.71		.088	0.87	1.25	0.69		.487	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A

Notes. SE=standard error. Plots of the residuals and random intercepts indicated that the normality and homoscedasticity assumptions for these models were met. In a sensitivity analysis, data points corresponding to standardized residuals with absolute values ≥ 3 in the Conditional Growth Models were excluded and the models re-run to determine the effect of outliers. Results did not change substantially.

N/A=Not applicable. The between-person variance in slope was not significant in the unconditional growth models predicting unactivated positive affect and gratitude; therefore, this random effect was excluded from the conditional growth models for these variables.