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## Self-efficacy and substance use outcomes for women in single gender versus mixed-gender group treatment

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### Abstract

**Objective**—This study examined baseline self-efficacy as a moderator of outcomes comparing women receiving either the Women's Recovery Group (WRG), a new manualized group treatment for substance use disorders combining single-gender group composition and women-focused content, or Group Drug Counseling (GDC), an empirically supported mixed-gender group treatment.

**Methods**—To understand the relationship of baseline scores of abstinence self-efficacy measured by the Drug-Taking Confidence Questionnaire (DTCQ) to outcome, we included the interaction of group by phase by continuous DTCQ scores in the outcome analyses. Women were split into groups of high versus low abstinence self-efficacy based on the clinical cutoff score of 80 on DTCQ.

**Results**—We found a significant 3-way interaction effect of treatment condition, time, and baseline DTCQ scores on drinking days and days of any substance use per month. Women in WRG had greater reduction in substance use from baseline to post-treatment than women in GDC, and women in WRG with low self-efficacy had the best outcomes overall.

**Conclusion**—The findings suggest that women with low self-efficacy may have enhanced treatment outcomes in a single-gender substance use treatment group.

### Keywords

Substance use disorders; Group therapy; Women; Self-efficacy; Recovery

## 1. Introduction

Self-efficacy is defined as an individual's belief that he or she has the ability to cope effectively with a particular high-risk situation (Bandura, 1986). Abstinence self-efficacy plays a role in both treatment outcome and relapse prevention for individuals with substance use disorders (SUDs) (Trucco et al., 2007). Research has demonstrated that individuals with higher abstinence self-efficacy at baseline have better substance use outcomes at the end of treatment and at follow-up while those with lower abstinence self-efficacy have greater substance use following treatment (Witkiewitz & Marlatt, 2004; Greenfield et al., 2000). For example, one study showed alcohol dependent individuals with high abstinence self-efficacy at baseline had greater resistance to relapse post-treatment than those with low self-efficacy (Rychtarik et al., 1992). Additionally, Stephens et al. (1993) found that in a population of

marijuana users low baseline self-efficacy was indicative of greater marijuana use post-treatment. Another study found high self-efficacy at the end of treatment to be the strongest predictor of remaining abstinent 1 year later at follow-up (Ilgen, McKellar, Tiet, 2005). Furthermore, literature has begun to explore the role of self-efficacy in recovery from substance use disorders.

Because of gender differences in onset and pattern of substance use, as well as risk factors for and consequences of substance abuse, a number of authors have hypothesized that women would benefit more from woman-focused single-gender treatment rather than standard mixed-gender group treatment. (Copeland & Hall; 1992, Kauffman et al, 1995; Najavits, 2007; Greenfield, Brooks et al, 2007). Single-gender treatment groups have been hypothesized to provide a setting of enhanced comfort for women with substance use disorders. Previous research suggests this is because traditional mixed-gender treatment fails to adequately meet women's gender-specific needs (Copeland & Hall, 1992). A study by Kauffman et al. (1995) found that women with SUDs preferred to be in a single-gender treatment setting because they felt that many of their life experiences related to their addiction and recovery would be more easily understood by other women, such as interpersonal relationships, objectification of women, parenting issues, and life stresses specific to women. Additionally, women with experience in mixed-gender settings reported feeling judged, less understood, and stigmatized by the male group members (Kauffman et al, 1995). The environment fostered by a single-gender treatment group may increase the sharing of gender-specific concerns and problems related to substance use, therefore enhancing a sense of comfort and safety which could improve treatment outcomes for women, especially those with low self-efficacy (Greenfield et al., 2007). However, there is no previous research elucidating the relationship between abstinence self-efficacy and substance use outcomes for women in single-gender versus mixed-gender treatment groups.

The Women's Recovery Group (WRG), a new 12-session manualized group treatment for women with substance use disorders utilized both a single-gender group composition as well as gender-specific content. The WRG was pilot tested in a Stage I Behavioral Treatment Development Trial and examined substance use outcomes in women assigned to WRG (n=29) compared with those in a mixed-gender empirically supported manualized treatment, Group Drug Counseling, GDC (n=7). Women in both treatment groups had comparable reduction in substance use during treatment; however, women in WRG maintained substance use reduction at 6 months post-treatment follow-up (Greenfield et al., 2007). In this study, we examined whether baseline self-efficacy was associated with differences in end of treatment and 6-month post-treatment outcomes among women enrolled in WRG and GDC. Moreover, given the differential outcomes previously found in this study (Greenfield et al, 2007), we aim to explore if baseline abstinence self-efficacy was a moderator of substance use outcomes for women in a novel single-gender treatment group when compared with women in an empirically supported mixed-gender group.

## 2. Methods

### 2.1 Treatments

The Women's Recovery Group (WRG) is a new 12-session manual-based relapse-prevention group therapy that utilizes a cognitive-behavioral approach developed for this study by the principal investigator (SFG). A detailed description of the study design and WRG intervention manual are available (Greenfield et al. 2007). In short, the content of this treatment focuses on issues of substance abuse directly related to women in recovery including, but not limited to, co-occurring psychiatric disorders, family relationships, the importance of self-care, and women's physical health. Our comparison treatment, Group Drug Counseling (GDC) ( Crits-Christoph et al, 1999), is an empirically supported group

treatment delivered typically to mixed-gender groups with no explicit attention to gender-specific issues. Both groups used a 90 minute structured format and covered common recovery topics such as triggers to use, relapse prevention, use of self-help, among others.

## 2.2 Procedures

Participants were recruited from the Alcohol and Drug Treatment Program at McLean Hospital and surrounding areas using flyers, advertisements, and clinician referrals. There were two rounds of recruitment for this study, a pre-pilot round and a pilot round. The purpose of the pre-pilot round was to test the new manualized treatment in a small group of women (Greenfield et al, 2007). Thirteen alcohol treatment participants were recruited in the pre-pilot phase of the study and 100% completed treatment and 6-month post-treatment follow-up. At the end of the pre-pilot round, the WRG manual was revised based on patient, counselor, and outside consultant feedback. However, such revisions were minimal and included some reworking and rewording of bulletin board materials and take home messages. In the pilot phase of the study, twenty-three participants were randomly assigned to either WRG (N=16) or GDC (N=7). Eighteen (78.3%) of the twenty-three randomized pilot participants completed treatment and twenty (87.0%) completed the follow-up session at 6-months post-treatment. In total, 36 women completed this Stage I Behavioral Treatment Development study, 29 WRG women and 7 GDC women. Outcomes were compared between groups (WRG vs. GDC), within groups, and also during treatment and post-treatment.

## 2.3 Participants

To be eligible for the study, participants had to be at least 18 years old, meet criteria for current substance dependence according to the DSM-IV, have used drugs or alcohol during the last 60 days, and be available for follow-up. Individuals with cooccurring bipolar, psychotic, or post-traumatic stress disorder were excluded. The age of the participants ranged from 23 to 67 with a mean age of 58.3 years (SD= 7.18) for women in GDC and of 45.0 years (SD=10.73) for all WRG women. The sample for this study was predominantly well-educated and white, with only one ethnic minority enrolled. One hundred percent had graduated from high school, and more than eighty-five percent of women in both treatment groups attained a college education. Among all WRG women, 41.4% (12) were married as were 42.9% of GDC women.

Of women in WRG, 86.2% (25) met criteria for alcohol dependence while the remaining 13.8% (4) met criteria for cannabis, cocaine, or stimulant dependence. On the other hand, all of the women in GDC (7) endorsed alcohol as their primary substance of dependence. In addition to meeting criteria for substance dependence, over one-third of women in the study met criteria for other current co-occurring psychiatric disorders, while three-fourths met criteria for a co-occurring psychiatric disorder at some point in their lifetime. None of the differences were statistically significant. All subjects provided informed consent. The procedures followed were in accord with the standards of the Institutional Review Board of McLean Hospital.

## 2.4 Measures

Substance use was assessed at baseline, during treatment (months 1-3) and post-treatment (months 4-6 and 9) using the Timeline Follow-Back technique. This method uses a calendar to assist participants with recall of drug and alcohol use over a specified amount of time (i.e. 60 days before interview). We used the Drug Taking Confidence Questionnaire (DTCQ) developed by Annis and Martin (1985) to assess self-efficacy at baseline. The DTCQ, which is based on the Situational Confidence Questionnaire (Annis, 1987), uses eight subscales of high risk situations for relapse to assess self-efficacy for resisting alcohol and/or drug use

including: Unpleasant Emotions (10 items), Physical Discomfort (5), Pleasant Emotions (5), Testing Personal Control (5), Urges and Temptations to Use (5), Conflict With Others (10), Social Pressure to Use (5), and Pleasant Times with Others (5) (Annis et al, 1997). On this 50 item questionnaire, participants rate on a scale from 0% (*not at all confident*) to 100% (*very confident*) how confident they are that they could abstain from using their drug of choice in a variety of high-risk situations. This DTCQ has been shown by Sklar, Annis, and Turner (1997) to be highly reliable and valid. As is standard with this measure, confidence scores for each subscale are calculated by averaging confidence ratings for each item (ranging 0 to 100) within the eight different subscales. For purposes of this study, we took the mean of the eight confidence scores to come up with one total continuous confidence score. A score of 80 and above indicates that an individual's confidence in being able to resist drugs or alcohol in a risky situation is very high (Annis, Sklar, Turner, 1997). Women with DTCQ scores higher than or equal to 80 were compared to those with scores less than 80, thus creating balanced categories of “high” and “low” self-efficacy, as a secondary measure of DTCQ.

## 2.5 Statistical Analysis

As reported by Greenfield et al. (2007), we implemented a general mixed model analysis of variance (MMANOVA) (Schwarz, 1993). This framework models the means per group over the respective time period and the covariance between the repeated measures over the assessments. We focused on the difference between groups across phase as modeled by the interaction of treatment and phase. Outcome measures are defined as the changes from baseline, acquired by subtracting the baseline for all outcomes which resulted in near normality for each outcome (Keselman et al., 1998).

The Institute of Medicine (2001) provides guidelines to maximize information from small trials, such as this study, in order to obtain reliable and valid results. One recommended statistical approach is hierarchical models, where we have hierarchical levels of clustering (multiple assessments within patients). The benefit of the modeling strategy is that when the within subject correlation is properly incorporated, this repeated measures analysis takes full advantage of all information obtained from each subject, thereby greatly increasing statistical power (Gibbons et al., 1993).

The mixed effects modeling strategy allows for the inclusion of covariates. To understand the impact of baseline scores of self-efficacy on the Drug-Taking Confidence Questionnaire (DTCQ), we included the interaction of group by phase by the continuous DTCQ in the outcome analyses. The models consisted of the three-way interaction, with all 2-way interactions, and main effects in the outcome models. A significant three-way interaction would indicate the difference between groups across phase were dependent on whether a person was high or low on baseline DTCQ. The DTCQ was analyzed as a continuous measure and therefore we interpreted our results based on the statistical significance and magnitude of the regression coefficients, which represent the on-average increase in outcome per unit increase in DTCQ from the specified MMANOVA to examine the impact DTCQ scores had by treatment condition, where more positive values indicate increase in usage for higher DTCQ scores and more negative values indicate a decrease in usage for higher DTCQ scores.

As reported by Greenfield et al. (2007), group assignment differed with respect to age at time of enrollment in the study. Therefore, the effect of age was adjusted for in all main outcome analyses. In order to quantify the amount of change dependent on DTCQ, treatment group, phase, an estimated mean change from baseline for each outcome was derived from the MMANOVA for each combination of group, phase, and level of DTCQ, where DTCQ was split into high versus low based on the clinical cutoff of 80 per Annis et al. (1997).

### 3. Results

#### Self-efficacy and Outcome

Baseline self-efficacy scores were obtained from a total of 30 subjects (24 WRG subjects and 6 GDC subjects). Based on a cut-off score of 80 and above for high self-efficacy, 17 subjects (15 WRG, 2 GDC) qualified as having low self-efficacy and 13 subjects (9 WRG and 4 GDC) qualified as having high self-efficacy. The analysis of baseline self-efficacy as a moderator of outcomes assessed during treatment and in the 6 months post-treatment found a significant 3-way interaction effect of treatment condition, time, and clinical cutoff of the baseline DTCQ scores on number of drinking days per month ( $F=5.34$ ,  $p=0.0221$ ) and days of any substance use ( $F=5.26$ ,  $p=0.023$ ).

To examine the magnitude of the relationship between continuous DTCQ scale and substance use outcome, regression coefficients using the continuous baseline DTCQ scores were calculated as shown in Table 1, which produced significant effects for both outcomes ( $F=4.56$ ,  $p=0.034$ ) and days of any substance use ( $F=4.31$ ,  $p=0.039$ ).

In the GDC treatment group, the slopes during both active treatment and at the post-treatment follow-up were negative indicating those subjects with higher baseline DTCQ scores had on average greater reduction in drinking days per month. In addition, the relationship of DTCQ to change in drinking days per month and change in days of any substance use per month during the 6-month follow-up period was more than twice that of the 3-month in-treatment phase. By contrast, in the WRG group, there was a weaker association, as well as an inverse relationship, between DTCQ and reduction in drinking days during treatment and follow-up. Women in WRG with higher self-efficacy had on average less reduction in drinking days per month during the follow-up phase compared to those women with lower self-efficacy. There were similar interactions between DTCQ and reduction in drinks per drinking day and mean number of days per month of any substance use among women in the WRG condition.

To further understand the relationship between DTCQ and the group by phase effect, we examined the relationship between high and low self-efficacy based on the standard cut-off score of greater than 80 for high confidence and a DTCQ score equal to or less than 80 for low self-efficacy. Estimated mean change scores in the three outcome measures are illustrated in Figures 1 – 3. A positive change indicates on-average increased use from baseline, whereas a negative change indicates on-average decreased use from baseline. For women in the GDC, those with DTCQ scores less than or equal to 80 had increased drinking days, drinks per drinking day, and days of any substance use both during active treatment and at 6 months follow-up. However, women in the GDC condition with DTCQ scores greater than 80 had reductions in days of any substance use during both active treatment and in the 6 month follow-up. By contrast, women assigned to WRG had more reduction in number of drinking days, drinks per drinking days, and number of days per month of any substance use during treatment and post-treatment regardless of high versus low DTCQ scores. In addition, among women in the WRG condition, the magnitude of the reduction in mean drinking days, drinks per drinking day, and days of any substance use on average was larger for women with low compared to high baseline DTCQ.

### 4. Discussion

In this Stage I Trial, women in GDC with high self-efficacy had greater reduction in days of any substance use during the 12-week treatment and 6 month follow-up compared with women in GDC with low self-efficacy. By contrast, women in the WRG group therapy had reductions in drinking days, drinks per drinking day, and days of any substance use

regardless of their self-efficacy level at baseline. The magnitude of the reduction was greater among those with low self-efficacy compared to high self-efficacy in the WRG group. In fact, the greatest reductions in days of any substance use during treatment and follow-up compared with baseline were in the women with low self-efficacy assigned to WRG compared with women with high self-efficacy in either treatment condition. These findings suggest there may be components of utilizing single-gender group therapy for women with low self-efficacy that may help enhance substance use treatment outcomes for these women.

While previous research has examined abstinence self-efficacy as it relates to treatment outcome, this study is unique in that it examines treatment outcomes for women enrolled in either women-focused or mixed-gender group treatment who are heterogeneous with respect to their co-occurring other psychiatric disorders (Greenfield, et al. 2007). The results found in GDC group treatment support previous work demonstrating that higher self-efficacy at beginning of treatment is related to more reduction in substance use outcomes at the end of treatment and at follow-up (Ilgen, McKellar, Tiet, 2005; Rychtarik et al., 1992). Unlike other studies, however, women in WRG with low self-efficacy did better than women in WRG with high self efficacy and better than women with both high and low self-efficacy in GDC. Previous work suggests that single gender group therapy for women enhances comfort and promotes communication (Kauffman et al, 1995) thereby enhancing outcome (Greenfield et al, 1997). Our study demonstrates that this may be especially true for women with low self-efficacy.

The 12 week sessions of WRG provide participants with education about gender-specific factors that can promote or interfere with women's recovery including the role of co-occurring psychiatric disorders, caretaking and partners, and overcoming obstacles to treatment. In particular, the WRG promotes women's self-care and endorses seeking effective treatment for co-occurring psychiatric disorders (Greenfield et al, 2007). The enhanced comfort women report experiencing in all women's group treatment has been hypothesized as a mechanism to improve treatment outcomes (Nelson-Zlupko et al, 1996). This may be a factor which contributed to the differential treatment outcomes for women in WRG as opposed to those in GDC. Additionally, the continued improvements seen by women in WRG, especially those with low-self efficacy at baseline, may be related to coping skills (Carroll et al. 1994) and enhanced self-efficacy acquired by these women in a supportive single-gender context.

Another rationale for why low self-efficacy women in WRG had better outcomes than women with low or high self-efficacy in either group is that their gender-specific needs were met during treatment. Rather than discussing recovery in a mixed-gender context where women report experiencing issues of shame and stigma, the WRG women who were less confident in their ability to stay clean in high-risk situations may have had an enhanced ability to discuss their recovery in terms of their role as women and how this role was shaped by the different demands of their interpersonal relationships. The focus on topics relevant to women, such as the role care-taking and intimate partners play in recovery and relapse, as well as coping with hormonal changes which may trigger desire to use, may enhance identification of sex-specific triggers and coping strategies that are less likely to be explored in a mixed-gender group treatment. High-risk situations leading to relapse differ for men and women (Annis & Graham, 1995; Skutle, 1999) and low self-efficacy women in the WRG group, relative to other women in the study, may have especially found a greater ability to more openly and thoroughly discuss how to cope with high-risk situations specific to their gender.

Ilgen, Tiet, Finney, and Moos (2006) found that patients with low self-efficacy who had a strong treatment alliance with their therapist had better outcomes than patients with who had

low self-efficacy and poorer treatment alliance. Their outcomes were comparable to individuals with high baseline self-efficacy, whose outcomes were not related to therapist alliance. Therefore, for those with low-self efficacy, therapeutic alliance influenced substance use outcomes. Less is known about the interaction of individual self-efficacy and specific types of treatment and their relationship with substance use outcomes for women. Ours is the first study to examine relationship between the type of group therapy, baseline self-efficacy, and substance abuse treatment outcome.

The present study had a number of potential limitations. One limitation is the small sample size and the imbalance of women in GDC compared with WRG. Despite the low sample size, Clarke and Wheaton (2007), showed only a small bias in estimates and standard errors even when the number of subjects per group is as low as 5 under this hierarchical methodology. Women in this study were homogeneous with respect to ethnic background and primary substance of abuse and thus these findings may not generalize to women with other clinical or demographic characteristics. In addition, we did not measure self-efficacy at the end of treatment or during the follow-up phase and, therefore, could not test hypotheses about the relationship between change in self-efficacy and treatment outcomes among women in either treatment group. Another limitation of the study is that follow-up data was collected 6 months post-treatment and evaluations at greater time post-treatment might have yielded different outcomes. Nevertheless, we are aware of no other studies examining potential moderators of differential treatment outcomes for women participating in women-only substance abuse treatment groups versus mixed-gender groups.

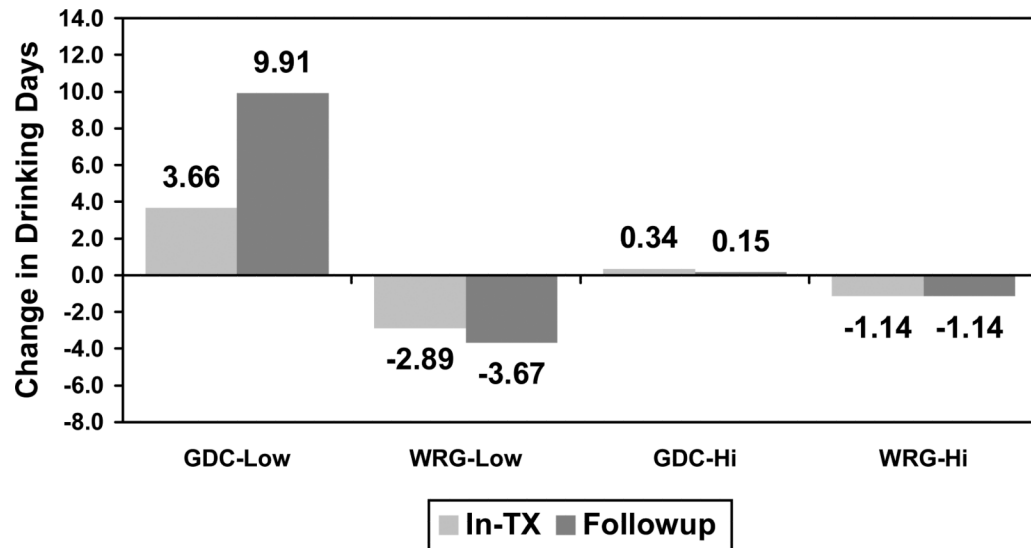
The results of this study suggest a number of ways that substance abuse treatment could be tailored to better meet the needs of women, but further research in this area is necessary. Future studies may explore effective group therapy for vulnerable groups such as women with low self-efficacy, and whether enhancing self-efficacy may serve as a mechanism of action for treatment outcomes, relapse prevention, and recovery, in women-focused group therapy. It would be of interest to examine abstinence self-efficacy as a mediator rather than a moderator, thus exploring treatment methods which increase self-efficacy and produce improved substance abuse treatment outcomes. Future research will also enhance our understanding of effective treatments by examining other mechanisms of action of treatment methods that meet the individual needs of women and improve long-term treatment outcome and recovery.

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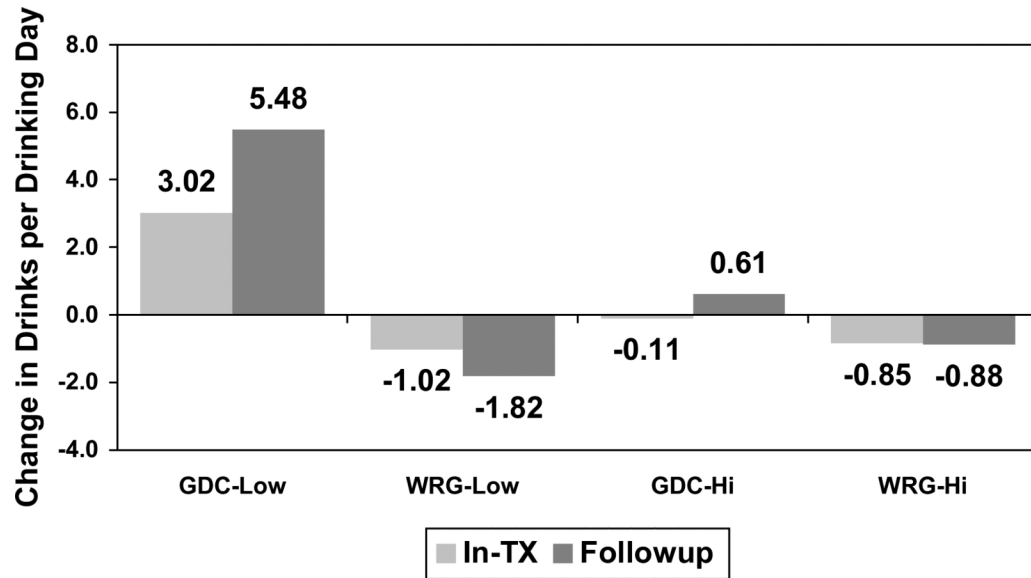
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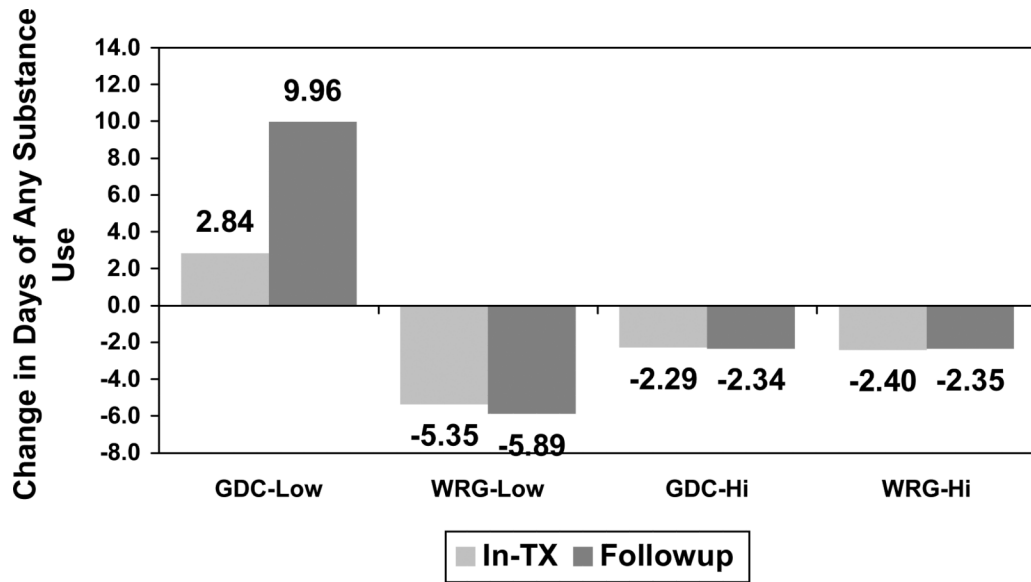




**Figure 1.**  
Change in Drinking Days compared to baseline as a function of group assignment and DTCQ clinical cutoff score of 80.



**Figure 2.** Change in Drinks per Drinking Day compared to baseline as a function of group assignment and DTCQ clinical cutoff score of 80.



**Figure 3.** Change in Days of Any Substance use compared to baseline as a function of group assignment and DTCQ clinical cutoff of 80.

**Table 1**

Slope Coefficients (24 vs. 6)

Group and Phase	OUTCOMES		
	Change in Drinking Days	Change in Drinks per Drinking Day	Change in Any Substance
	Beta (se)	Beta (se)	Beta (se)
GDC – In-Treatment	-0.150 (0.158)	-0.104 (0.154)	-0.147 (0.260)
GDC – Followup Phase	-0.357 (0.151)	-0.183 (0.151)	-0.390 (0.254)
WRG – In Treatment	0.013 (0.045)	-0.017 (0.043)	0.048 (0.073)
WRG –Followup Phase	0.094 (0.042)	0.016 (0.043)	0.111 (0.072)

5. Note: Change is in relationship to baseline value.