



Published in final edited form as:

Drug Alcohol Depend. 2013 September 1; 132(0): 182–188. doi:10.1016/j.drugalcdep.2013.01.018.

The effect of drinking goals at treatment entry on longitudinal alcohol use patterns among adults with alcohol dependence*

Orion Mowbray^{1,2}, Amy R. Krentzman², Jaclyn C. Bradley², James A. Cranford², Elizabeth A.R. Robinson², and Andrew Grogan-Kaylor¹

¹University of Michigan School of Social Work, 1080 S. University, Ann Arbor MI, 48109.

²University of Michigan Department of Psychiatry Addiction Research Center and Substance Abuse Section, 4250 Plymouth Rd., Ann Arbor MI, 48109.

Abstract

BACKGROUND—Drinking goals at treatment entry are a promising, yet under-studied mechanism of change in alcohol use following treatment. It is not known who, upon treatment entry, is likely to desire abstinence as a drinking goal and whether desiring abstinence as a drinking goal influences alcohol use following treatment.

Methods—Data from a 2.5-year longitudinal study of alcohol-dependent adults from 3 treatment sites is examined in a secondary data analysis. At treatment entry, participants reported sociodemographic and clinical characteristics, as well as whether they desired abstinence as a drinking goal or not. At each subsequent wave, participants reported their alcohol use.

Results—Bivariate analyses showed that individuals from a VA outpatient treatment site, men, and racial or ethnic minorities were most likely to desire abstinence as a drinking goal at treatment entry. Multi-level mixed effects regression models indicated that individuals who at baseline desired abstinence as a drinking goal sustained higher percentage of days abstinent and higher percentage of days since last drink 2.5 years following treatment entry, compared to individuals who did not desire abstinence.

Conclusions—Understanding who is most likely to desire the specific drinking goal of abstinence can assist clinicians in anticipating client response to goal setting. Furthermore, by understanding the benefits and risks associated with drinking goals, clinicians can focus attention to individuals who desire a more risk-laden goal, including goals of non-abstinence, and tailor interventions, including motivational interviewing techniques, to support effective goals.

*Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi:...

Correspondence should be addressed to: Orion Mowbray, 1080 S. University, Ann Arbor, MI 48109, Ph: 734-260-4730, omowbray@umich.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Contributors: Orion Mowbray drafted the manuscript and conducted all analyses presented. Amy Krentzman contributed to the original idea development and provided substantive reviews of all manuscript drafts. Jaclyn Bradley contributed to the original idea development and performed preliminary analyses associated with the data presented. James Cranford and Elizabeth Robinson provided a review of the final manuscript draft. Andrew Grogan-Kaylor oversaw the statistical analyses and contributed to the presentation of methods and results. All authors have approved of the final manuscript.

Conflict of Interest: All authors declare that they have no conflicts of interest.

Keywords

Drinking goals; abstinence; treatment; motivational interview and alcohol dependence

1. INTRODUCTION

1.1. Drinking goals as a mechanism of change

Treatments for alcohol dependence can be effective and increase the likelihood of recovery from alcohol problems (Dawson et al., 2006; Moos and Moos, 2006; Moyer et al., 2002). Of those who enter and complete treatment, approximately 60% will relapse to some drinking within the first year following alcohol treatment (Maisto et al., 2003; Whitford et al., 2009). With these findings in mind, current research on the outcomes of alcohol-use-disorder treatments examines mechanisms of change associated with reduced alcohol use (Longabaugh et al., 2006). In this paper, we analyze the demographic and clinical characteristics of participants who at treatment entry desired abstinence compared to participants who did not and subsequent 2.5-year alcohol-use patterns among participants who desired abstinence compared to participants who did not.

The question of whether individuals entering treatment should be given the choice of treatment goals, such as abstinence, remains a controversial issue in the field of alcohol research (Coldwell and Heather, 2006; Marlatt, 1983; Roizen, 1987). Despite this, allowing adults seeking treatment for alcohol dependence to self-select drinking goals upon treatment entry has become a common treatment practice (Foy et al., 1979; Sobell and Sobell, 1995). With self-selection of drinking goals becoming more common, clinicians may benefit from additional evidence that suggests who is most likely to desire a drinking goal of abstinence or non-abstinence. Clinicians may also benefit from evidence about the effects on subsequent alcohol use of choosing a drinking goal of abstinence or non-abstinence at treatment entry. This study examines these questions: Who is most likely to desire a drinking goal of abstinence at treatment entry, and does a drinking goal of abstinence predict subsequent drinking patterns?

The selection of drinking goals at treatment entry is a promising, yet under-studied, mechanism of change which may have an impact on alcohol use following treatment (Adamson et al., 2010). Examining drinking goals can have immediate clinical appeal. Clinicians frequently work with clients to establish a drinking strategy, and to instill motivation for maintaining that strategy throughout treatment. When examining outcomes associated with treatment for alcohol use disorders in Project MATCH, identifying abstinence as a drinking goal was a critical element in changes associated with remission of alcohol dependence (DiClemente, 2007). Additional longitudinal research from the United Kingdom showed that abstinence as a drinking goal upon treatment entry significantly predicted higher percentage of days abstinent one year later (Adamson et al., 2010).

Additionally, clients prefer to have a choice of drinking goal (Sobell and Sobell, 1992) and that people are more likely to achieve goals they self-select than goals imposed on them (Bandura, 1986; Brehm and Brehm, 1981; Deci and Ryan, 1985). However, those who desire a non-abstinence drinking goal upon treatment entry continue to drink at heavy levels following treatment, compared to those who select a drinking goal of abstinence (Adamson and Sellman, 2001). This finding suggests that in terms of long-term change, self-selection of drinking goals, especially a non-abstinence drinking goal, may not produce sustained behavioral change.

Yet, evidence is mixed as to whether abstinence as a drinking goal at treatment entry has any influence on future alcohol use. Early research on drinking goals showed that when clients were allowed to establish their own goals (either abstinence or non-abstinence), those who adopted a non-abstinence drinking goal experienced drinking problems for a shorter period of time and were more accurate in predicting whether they could meet their drinking goal (Pachman et al., 1978). Subsequent longitudinal studies comparing those who adopted a non-abstinence drinking goal and those who adopted abstinence as a drinking goal found there was little difference between these two groups in mean daily alcohol consumption or in the length of drinking problem (Adamson and Sellman, 2001; Booth et al., 1984).

Within the literature examining abstinence as a drinking goal, several limitations are worth mentioning. Of the research reviewed, the timeframe of post-treatment follow-up under analysis varies from 4 weeks to 6 months; a relatively short length of time. The available data is inconclusive about whether the goal of abstinence produces the same or different alcohol-use outcomes following treatment compared to a goal of non-abstinence. Furthermore, even in treatment settings where abstinence is encouraged, many clients adopt non-abstinence drinking goals and do not achieve total abstinence (Hall et al., 1990). Finally, not all studies of drinking goals are from the United States, where the vast majority of treatment centers advocate abstinence and only abstinence. Thus results from other countries may not generalize to understanding associations with drinking goals in places where abstinence is the primary goal of treatment (such as in the United States; Cox et al., 2004; Rosenberg and Davis, 1994). A detailed and refined approach to examining alcohol use between individuals who adopt abstinence and individuals who adopt a non-abstinence drinking goal is needed.

1.2. Current directions of research in drinking goals and alcohol use

In addition to interest in how drinking goals are associated with alcohol use over time, demographic and clinical characteristics of those who are most likely to desire abstinence as a treatment goal is also of interest. Previous research has found that abstinence is more likely to be a drinking goal among men, those who are employed, those who are highly educated, and racial or ethnic minorities (Adamson and Sellman, 2001; Booth et al., 1984; Heather et al., 2010; Pachman et al., 1978). However, these results are derived from studies composed of small samples or from outside of the United States, where abstinence-based treatment approaches are less dominant. Additionally, the long-term impact of abstinence as a drinking goal at treatment initiation on longitudinal alcohol use patterns is not known. To extend the research on drinking goals at treatment entry and its relationship to subsequent alcohol use, this analysis examines data from the Life Transitions Study (LTS; Robinson et al., 2011), a 3-year longitudinal panel study originally designed to examine the relationship between spirituality, Alcoholics Anonymous participation, and drinking outcomes.

2. METHOD

2.1. Sample

Data from the LTS (Robinson et al., 2011) were examined in a secondary analysis. The LTS is a longitudinal study of 364 adults who met DSM-IV criteria for alcohol dependence who were drawn from treatment and non-treatment sources. For this analysis, 93 LTS participants who were not in treatment were dropped, given the current study's interest in abstinence as a drinking goal upon treatment entry. This left a final sample size of 271 alcohol-dependent adults who were in treatment for alcohol dependence at their baseline interview. Participants included in the current study were recruited from three sites: 1) a university-affiliated outpatient addiction treatment program (n=157), 2) a VA outpatient substance use treatment clinic (n=80), and 3) a drinking program which helped individuals

to reduce, but not to stop, their drinking (n=34). Both the university affiliated outpatient program and the VA outpatient treatment clinic adhere to classic, abstinence-based treatment models. All study procedures were approved by the appropriate IRB committees.

Participants completed in-person interviews every 6 months for 2.5 years (see Robinson et al., 2011, for additional details). At baseline, all participants met criteria for alcohol dependence as measured by the Structured Clinical Interview for *DSM-IV* (SCID; First and Gibbon, 1997); had at least one drink in the 90 days prior to baseline; were aged 18 or older; had no evidence of current psychosis, suicidality, or homicidality; and were literate in English. All participants entered the study after they had been in treatment for 1 week, but not more than 4 weeks.

2.2. Measures

2.2.1. Sociodemographic characteristics—At baseline, participants were asked to report their age, gender, race/ethnicity, and number of years of education. Due to small numbers of some ethnic groups, race/ethnicity was recoded to three groups: White, Black/African American, and Other.

2.2.2. Clinical characteristics—At baseline, participants were asked yes/no questions about whether they had any previous experience with Alcoholics Anonymous (AA) and a family history of alcohol problems. Additionally, participants were asked at what age their alcohol problems began. Finally, participants were asked to complete the Short Inventory of Problems (SIP; Miller and Tonigan, 1995), a 15-item measure of the negative consequences of drinking ($\alpha = .91$).

2.2.3. Abstinence as a drinking goal—At study entry, participants were asked if they wanted to be abstinent. Responses options to this question were 4 categories: “yes,” “no,” “maybe,” and “don’t know.” Participants who responded with “maybe” and “don’t know” were re-coded to a “no” response based on analyses that showed no significant differences in sociodemographic and clinical characteristics between these those who responded “maybe,” “don’t know,” or “no” to the question of whether they wanted to be abstinent.

2.2.4. Alcohol use—At each of the 6 waves of data collection, data on alcohol use was obtained with the Timeline Follow-Back (TLFB; Sobell and Sobell, 1992), which yielded data on alcohol use in the last 90 days including Percent Days Abstinent, Percent Heavy Drinking Days, and Days Since Last Drink.

2.3. Analysis plan

Bivariate analyses examined who was most likely to endorse abstinence as a drinking goal at baseline. To understand how abstinence as a drinking goal at baseline influenced subsequent alcohol use, multilevel mixed-effects linear regression models were constructed to examine change in alcohol use patterns over a 2.5-year time period, as measured by the TLFB. These statistical models account for correlated data that results from repeated observations upon the same individuals, and adjust *p* values accordingly (Bryk and Raudenbush, 1992).

Our use of multilevel models for examining the time trajectories of different outcomes merits some brief discussion. A thorough treatment of multilevel models for longitudinal data is beyond the purview of this article, but excellent treatments of this subject can be found in a number of sources (e.g., Singer, 1998; Singer and Willett, 2003; Willett et al, 1998). Briefly, in our statistical models for this research project, we included main effects for having an abstinence goal and for other covariates of interest. We also included a set of indicator variables for time, in order to model the time trajectory of each outcome. Lastly,

we included an interaction of having an abstinence goal with the indicator variables for time, to examine whether or not those with an abstinence goal had a different time trajectory than those who did not. All analyses were completed in STATA Version 12 (StataCorp, 2011). The syntax associated with models tested in STATA is contained in the Supplementary Material¹.

Finally, all models presented are linear where dependent variables are considered as continuous measures. Percent days abstinent and percent heavy drinking days are measured as percentages, and are thus bounded by 0.0 and 1.0. To examine whether all dependent variables could be appropriately estimated with a linear multilevel model, results from censored (tobit) multilevel models were compared to linear models. Censored models showed no differences in the size or significance of model coefficients compared to the linear models presented.

3. RESULTS

Sociodemographic and clinical characteristics of the sample are presented in Table 1. At baseline, 80.1% of the sample desired abstinence as a drinking goal. The mean age of the sample was 44.6 years. Over 68% of the sample was male and a majority were White. The mean level of education was 14.4 years. Seventy-six percent of the sample reported prior experience with Alcoholics Anonymous (AA), slightly more than 87% reported a family history associated with alcohol problems, and the average age of onset of alcohol dependence for the sample was 29.5 years.

Table 2 presents our 3 dependent measures separately for individuals who desire abstinence as a drinking goal and those who desire a non-abstinence drinking goal at baseline (Wave 1). Across all dependent measures, a general trend is shown, regardless of drinking goal, of increased percent days abstinent, fewer percentage of heavy drinking days, and increased days since last drink at 2.5 year follow-up (Wave 6) compared to baseline.

3.1. Who is most likely to desire abstinence at treatment entry?

Table 1 shows the bivariate analyses of the sample examining who was more likely to desire abstinence as a drinking goal at baseline. The column titled “ χ^2 or F” indicates the significance of the differences between groups. The analyses showed that 91.2% of participants from the VA treatment program desired abstinence as a drinking goal, while 83.4% of respondents from the University outpatient site and only 38.2% from the moderated drinking program desired abstinence as a drinking goal, $\chi^2(2, N = 271) = 44.7, p < .01$. Additionally, 85.9% of men desired abstinence as a drinking goal compared to 67.4% of women, $\chi^2(1, N = 271) = 12.6, p < .01$. Furthermore, 100% of Black/African Americans and 92.9% of participants in the “other” racial/ethnic category desired abstinence as a drinking goal at baseline, while only 77.8% of White participants reported a desire for abstinence as a drinking goal at baseline, $\chi^2(2, N = 271) = 6.7, p < .01$. There were no differences in age or education between participants who desired abstinence as a drinking goal and participants who did not.

In terms of clinical characteristics, 83.4% of the respondents who had previous experience with AA desired abstinence as a drinking goal at baseline, while only 50% of participants with no previous experience with AA desired abstinence as a drinking goal, $\chi^2(1, N = 271) = 27.1, p < .01$. Finally, participants who desired abstinence as a drinking goal reported more alcohol-related problems (as assessed by the SIP) than participants who did not desire

¹Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi...

abstinence as a drinking goal $F(1,271) 18.9, p < .01$. There were no differences associated with family history or age of alcohol dependence onset between participants who desired abstinence as a drinking goal and participants who did not.

3.2. Does abstinence as a drinking goal at treatment entry influence alcohol use over time?

In order to examine longitudinal results, multilevel mixed-effects linear regression models examined the relationship between abstinence as a drinking goal at baseline and change in alcohol use patterns over 2.5 years. The dependent variables measuring alcohol use were Percent Days Abstinent, Percent Heavy Drinking days, and Days Since Last Drink. All regression models controlled for sociodemographic variables (treatment site, age, gender, race/ethnicity, and education) and clinical variables (previous experience with AA, family history, age of onset, and SIP score).

The multilevel models are presented in Table 3 and warrant brief discussion. Table 3 presents a longitudinal analysis of 3 dependent variables examining (1) whether participants who desire abstinence are significantly different from participants with a non-abstinence goal at the model intercept (desire for abstinence), (2) the predicted values in the dependent variable for participants with a non-abstinence goal (Wave), and (3) the predicted values for participants who desire an abstinence goal either above or below participants with a non-abstinence goal (Desire for abstinence \times Wave).

The first model examined Percent Days Abstinent (PDA) over time. Controlling for sociodemographic and clinical factors, this model shows participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model intercept in terms of PDA. However, regression modeling indicated that individuals with abstinence as a drinking goal showed significantly increased PDA compared to participants with non-abstinence as a drinking goal at wave 2 ($\beta = 9.31, SE = 4.22$), and most notably in later waves up to 2.5 years following treatment entry, including Wave 5 ($\beta = 9.96, SE = 4.33$) and Wave 6 ($\beta = 12.93, SE = 4.38$). Among our control variables, participants from the moderated drinking program had significantly fewer PDA compared to participants from the university outpatient program ($\beta = -27.59, SE = 3.86$). Participants with higher education had significantly fewer PDA ($\beta = -1.01, SE = 0.51$) and participants with a younger age of onset had significantly fewer PDA ($\beta = -0.26, SE = 0.11$). No other associations were found with PDA.

The second model examined percent Heavy Drinking Days (HDD) over time. Controlling for sociodemographic and clinical factors, this model shows participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model intercept in terms of HDD. However, regression modeling showed participants with abstinence as a drinking goal showed significantly lower HDD compared to participants with non-abstinence as a drinking goal at Wave 2 ($\beta = -8.13, SE = 3.98$). No differences emerged in HDD between participants with abstinence as a drinking goal and participants with non-abstinence as a drinking goal at subsequent waves. However, among our control variables, individuals in the moderated drinking program showed significantly increased HDD compared to individuals from the university outpatient program ($\beta = 6.41, SE = 2.99$). Additionally, having a family history associated with alcohol abuse/dependence was related to increased HDD ($\beta = 4.99, SE = 2.55$), an older age of onset was related to increased HDD ($\beta = 0.24, SE = 0.08$), and higher numbers of drinking consequences (SIP) were related to increased HDD ($\beta = 0.23, SE = 0.08$). No other associations were found with HDD.

Finally, the third model examined Days Since Last Drink (DLD). Controlling for sociodemographic and clinical factors, this model shows participants who desire abstinence are not significantly different from participants with a non-abstinence goal at the model

intercept in terms of DLD. Further, regression modeling showed no significant difference in PDA between participants with abstinence as a drinking goal and participants with non-abstinence as a drinking goal at Wave 2. However, in later waves up to 2.5 years following treatment entry, participants with abstinence as a drinking goal showed significantly more DLD compared to participants with non-abstinence as a drinking goal at Wave 3 ($\beta = 116.92$, $SE = 38.67$), Wave 4 ($\beta = 161.64$, $SE = 38.84$), Wave 5 ($\beta = 202.57$, $SE = 39.13$), and Wave 6 ($\beta = 256.25$, $SE = 39.66$). Among our control variables, participants from the moderated drinking program had significantly fewer DLD compared to participants from the university outpatient ($\beta = -57.23$, $SE = 28.34$). Participants from the VA treatment program had significantly more DLD compared to participants from the university outpatient ($\beta = 145.32$, $SE = 38.23$). Last, older age was significantly related to more DLD ($\beta = 4.12$, $SE = 1.09$). No other associations were found with DLD.

4. DISCUSSION

When examining drinking goals at treatment entry, it is worth noting that not all participants from classic, abstinence-based treatment models (in this study, the university-affiliated outpatient addiction treatment program and the VA outpatient substance use treatment clinic) desired abstinence as a drinking goal, and not all participants from the moderated drinking program desired a non-abstinence as a drinking goal. Slightly over 38% of participants from the moderated drinking program desired a goal of abstinence and between 8% and 16% of participants from the abstinence-based treatment program desired a non-abstinence drinking goal.

Further, the results showed individuals from the VA clinic, individuals who were male, individuals who were racial or ethnic minorities, individuals with previous experience with AA, and individuals with more negative experiences associated with alcohol use (as indicated by higher SIP scores) were those most likely to desire abstinence as a drinking goal. These results are supported by previous research that has also shown that men, racial/ethnic minorities and those with more alcohol-related support/treatment experience are most likely to adopt abstinence as a drinking goal (Adamson and Sellman, 2001; Booth et al., 1984; Heather et al., 2010; Pachman et al., 1978). These results demonstrate a similar pattern of findings with studies conducted on drinking goals in other countries where alternatives to abstinence are also legitimate goals of treatment (such as in European regions), offering generalizability to the known differences between individuals who desire abstinence as a drinking goal and individuals who desire a non-abstinence drinking goal at treatment entry.

Additionally, when examining drinking goals upon treatment entry and alcohol use following treatment, our results demonstrate that when controlling for sociodemographic, clinical, and treatment site characteristics, no differences emerge between individuals who desire a drinking goal of abstinence and individuals with a non-abstinence drinking goal at treatment entry. However, over time our results show that individuals who desire a drinking goal of abstinence at treatment entry reported increased percent days abstinent and more days since last alcohol use over time for 2.5 years following treatment entry compared to individuals with a non-abstinence drinking goal at treatment entry. This effect also emerged for a third longitudinal variable related to alcohol use, percent of heavy drinking days, but only at the second wave. No effect of drinking goal at treatment entry emerged for percent heavy drinking days at subsequent waves. This finding suggests that abstinence as a drinking goal at treatment entry may not have universal effects on alcohol use, when alcohol use is conceptualized as a multidimensional outcome of treatment (Heather and Tebbutt, 1989).

These results extend previous research that had shown differences in alcohol use following treatment between individuals who adopt a drinking goal of abstinence and individuals who adopt a non-abstinence drinking goal at treatment entry by expanding the time frame for longitudinal analysis of alcohol use out to 2.5 years following treatment entry. Our results suggest that individuals who desire a drinking goal of abstinence at treatment entry experience a sustained change in alcohol use that lasts well beyond treatment completion, up to two and a half years following treatment entry, compared to individuals who adopt a non-abstinence drinking goal.

4.1. Limitations

Responses to the question of abstinence as a drinking goal were recoded to combine those who replied “no,” “maybe,” or “don’t know” into one group based on a lack of differences in the demographic and clinical measures included in the analyses presented. Furthermore, at each wave, many individuals who desired abstinence as a drinking goal continued to report some, but low levels, of alcohol use rather than total abstinence. These analyses do not examine whether drinking goals at treatment entry were met at each wave. Future research in the area of drinking goals may be substantially enhanced through examining both goal formation and whether these goals are met through the treatment process and following treatment completion.

4.2. Conclusions

With these limitations in mind, our results can provide clinicians with an understanding of the characteristics of individuals who are most likely to adopt a drinking goal of abstinence at treatment entry, and the consequences of treatment-entry drinking goals on subsequent alcohol use. While the self-selection of drinking goals upon treatment entry has become more prevalent in the U.S. among individuals seeking treatment for alcohol dependence, understanding who is most likely to desire specific drinking goals, such as abstinence, can assist clinicians in anticipating drinking outcomes based on goals set early in a treatment episode. It is a common practice for clinicians to ask about motivation for abstinence. By understanding sociodemographic and clinical characteristics associated with answers to this question (whether a drinking goal of abstinence or a non-abstinence drinking goal is preferred), clinicians can successfully navigate responses to difficult questions concerning alcohol use at a point in treatment when the formation of positive client-clinician alliance is critical (Connors et al., 2000).

Last, by understanding the benefits and risks associated with a self-selected goal such as abstinence, clinicians can increase attention to individuals who adopt goals involving higher levels of alcohol consumption, such as a non-abstinent treatment goal. Our results show that individuals who desire abstinence as a drinking goal at treatment entry consume less alcohol 2.5 years following treatment compared to individuals who desire a non-abstinent drinking goal. This finding may suggest that alcohol-dependent adults who desire a non-abstinent drinking goal may be at higher risk for continued problematic drinking. However, with the large base of evidence supporting the effectiveness of motivational interviewing strategies in the treatment of alcohol dependent adults (Treasure, 2004), therapeutic strategies designed to resolve ambivalence and activate motivational processes within the individual to facilitate a change in alcohol use may be helpful in strengthening motivation for change among individuals who desire a non-abstinent drinking strategy upon treatment entry.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Role of funding sources: This project was supported by Grants R01 AA014442, R21-AA019723, T32 AA007477-21, and UL1RR024986 from the National Institutes of Health. The NIH had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

REFERENCES

- Adamson SJ, Heather N, Morton V, Raistrick D. Initial preference for drinking goal in the treatment of alcohol problems: II treatment outcomes. *Alcohol Alcohol*. 2010; 45:136–142. [PubMed: 20130150]
- Adamson SJ, Sellman JD. Drinking goal selection and treatment outcome in outpatients with mild-moderate alcohol dependence. *Drug Alcohol Rev*. 2001; 20:351–359.
- Bandura A. The explanatory and predictive scope of self-efficacy theory. *J Soc Clin Psychol*. 1986; 4:359–373.
- Booth PG, Dale B, Ansari J. Problem drinkers' goal choice and treatment outcome: a preliminary study. *Addict Behav*. 1984; 9:357–364. [PubMed: 6532142]
- Brehm, SS.; Brehm, JW. *Psychological Reactance*. Academic Press: New York; 1981.
- Coldwell B, Heather N. Introduction to the special issue. *Addict Res Theory*. 2006; 14:1–5.
- Connors GJ, DiClemente CC, Dermen KH, Kadden R, Carroll KM, Frone MR. Predicting the therapeutic alliance in alcoholism treatment. *J Stud Alcohol*. 2000; 61:139–149. [PubMed: 10627108]
- Cox WM, Rosenberg H, Hodgins CHA, Macartney JI, Maurer KA. United Kingdom and United States healthcare providers' recommendations of abstinence versus controlled drinking. *Alcohol Alcohol*. 2004; 39:130–134. [PubMed: 14998830]
- Dawson DA, Grant BF, Stinson FS, Chou PS. Estimating the effect of help seeking on achieving recovery from alcohol dependence. *Addiction*. 2006; 101:824–834. [PubMed: 16696626]
- Deci, EL.; Ryan, RM. *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Springer; 1985.
- DiClemente CC. Mechanisms, determinants and processes of change in the modification of drinking behavior. *Alcohol Clin Exp Res*. 2007; 31:13–20.
- First, MB.; Gibbon, M. *Users' Guide for the Structured Clinical Interview for DSM-IV Axis II Personality Disorders: Scid-II*. Washington, DC: American Psychiatric Association; 1997.
- Foy DW, Rychtarik RG, O'Brien TP, Nunn LB. Goal choice of alcoholics: effects of training controlled drinking skills. *Behav Cogn Psychother*. 1979; 7:101–110.
- Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug Alcohol Depend*. 2004; 74:223–234. [PubMed: 15194200]
- Hall SM, Havassy BE, Wasserman DA. Commitment to abstinence and acute stress in relapse to alcohol, opiates, and nicotine. *J Consult Clin Psychol*. 1990; 58:175–181. [PubMed: 2335634]
- Harwood HJ, Fountain D, Livermore G. Economic costs of alcohol abuse and alcoholism. *Recent Dev Alcohol*. 1998; 14:307–330. [PubMed: 9751951]
- Hasin DS, Stinson FS, Ogburn E, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results From the National Epidemiologic Survey on Alcohol and Related Conditions. *Arch Gen Psych*. 2007; 64:830–842.
- Heather N, Adamson SJ, Raistrick D, Slegg GP. Initial preference for drinking goal in the treatment of alcohol problems: I. baseline differences between abstinence and non-abstinence groups. *Alcohol Alcohol*. 2010; 45:128–135. [PubMed: 20130149]
- Heather N, Tebbutt J. Definitions of non-abstinent and abstinent categories in alcoholism treatment outcome classifications: a review and proposal. *Drug Alcohol Depend*. 1989; 24:83–93. [PubMed: 2676444]
- Kopelman MD, Thomson AD, Guerrini I, Marshall EJ. The Korsakoff Syndrome: clinical aspects, psychology and treatment. *Alcohol Alcohol*. 2009; 44:148–154. [PubMed: 19151162]

- Longabaugh R, Donovan DM, Karno MP, McCrady BS, Morgenstern J, Tonigan JS. Active ingredients: how and why evidence based alcohol behavioral treatment interventions work. *Alcohol Clin Exp Res*. 2006; 29:235–247. [PubMed: 15714046]
- Luke, DA. *Multilevel Modeling*. Thousand Oaks, CA: Sage; 2004.
- Maisto SA, Pollock NK, Cornelius JR, Lynch KG, Martin CS. Alcohol relapse as a function of relapse definition in a clinical sample of adolescents. *Addict Behav*. 2003; 28:449–459. [PubMed: 12628618]
- Marlatt GA. The controlled-drinking controversy: a commentary. *Am Psychol*. 1983; 38:1097–1110. [PubMed: 6357011]
- Miller, WR.; Tonigan, JS. *The Drinker Inventory of Consequences (DrInC): An Instrument for Assessing Adverse Consequences of Alcohol Abuse*. Project MATCH Monograph Series, Vol 4. DHHS Publication No. 95-3911. Rockville, MD: NIAAA; 1995.
- Moos RH, Moos BS. Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction*. 2006; 2006; 101:212–222. [PubMed: 16445550]
- Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*. 2002; 97:279–292. [PubMed: 11964101]
- Pachman JS, Foy DW, Van Erd M. Goal choice of alcoholics: a comparison of those who choose total abstinence vs those who choose responsible, controlled drinking. *J Clin Psychol*. 1978; 34:781–783. [PubMed: 690228]
- Raudenbush, SW.; Bryk, AS. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Thousand Oaks, CA: Sage Publications; 2002.
- Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*. 2009; 373:2223–2233. [PubMed: 19560604]
- Robinson EAR, Krentzman AR, Webb JR, Brower KJ. Six-month changes in spirituality and religiousness in alcoholics predict drinking outcomes at nine months. *J Stud Alcohol Drugs*. 2011; 72:660–668. [PubMed: 21683048]
- Roizen R. The great controlled-drinking controversy. *Recent Dev Alcohol*. 1987; 5:245–279. [PubMed: 3550913]
- Rosenberg H, Davis L-A. Acceptance of moderate drinking by alcohol treatment services in the United States. *J Stud Alcohol*. 1994; 55:167–172. [PubMed: 8189737]
- Singer J. Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *J Educ Behav Stat*. 1998; 24:323–355.
- Singer, JD.; Willett, JB. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. New York: Oxford University Press; 2003.
- Sobell MB, Sobell LC. Controlled drinking after 25 years: how important was the great debate? *Addiction*. 1995; 90:1149–1153. [PubMed: 7580815]
- Sobell, LC.; Sobell, MB. Timeline follow back: a technique for assessing self-reported alcohol consumption. In: Raye, Z.; Litten, J.; Allen, P., editors. *Measuring Alcohol Consumption: Psychosocial and Biochemical Methods*. Totowa: Humana Press; 1992.
- Stata Corp. *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP; 2011.
- Treasure J. Motivational interviewing. *Adv Psychiatric Treat*. 2004; 10:331–337.
- Whitford JL, Widner SC, Mellick D, Elkins RL. Self-report of drinking compared to objective markers of alcohol consumption. *Am J Drug Alcohol Abuse*. 2009; 35:55–58. [PubMed: 19322728]
- Willett JB, Singer JD, Martin NC. The design and analysis of longitudinal studies of development and psychopathology in context: statistical models and methodological recommendations. *Dev Psychopathol*. 1998; 10:395–426. [PubMed: 9635230]

Table 1

Sample characteristics and bivariate associations with desire for abstinence

N = 271	M or %	Abstinence Yes % or M	Abstinence No % or M	χ^2 or F
Abstinence as a drinking goal Site	80.1%	-	-	-
University outpatient	57.9%	83.4%	16.6%	44.7**
VA treatment program	29.5%	91.2%	8.8%	
Moderated drinking program	12.6%	38.2%	61.8%	
Age	44.6	45.1	42.9	1.06
Gender				
Male	68.2%	85.9%	14.1%	12.6**
Female	31.7%	67.4%	32.5%	
Race/ethnicity				
White	88.2%	77.8%	22.2%	6.7**
Black	6.6%	100%	0%	
Other	5.2%	92.9%	7.1%	
Education (in years)	14.4	14.2	14.9	1.34
Previous experience with AA	76.8%	87.2%	12.9%	27.1**
Family history	87.1%	80.1%	19.9%	0.5
Age of alcohol dependence onset	29.5	29.5	29.4	0.1
Short Inventory of Problems ¹	21.2	22.6	15.5	18.9**

* p < .05,

** p < .01

¹Miller et al., 1995. The SIP is a 15-item measure about negative consequences of drinking, $\alpha = .91$

Table 2

Abstinence and alcohol use variables

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
N = 271	% (M)	% (M)	% (M)	% (M)	% (M)	% (M)
Percent days abstinent ¹						
Abstinence Yes	61.89	90.17	88.64	89.21	85.53	88.01
Abstinence No	52.85	71.72	75.42	74.44	65.37	65.29
Percent heavy drinking days ¹						
Abstinence Yes	31.28	5.74	8.21	6.41	7.79	6.28
Abstinence No	29.75	12.66	11.11	9.85	12.14	12.30
Days since last drink ²						
Abstinence Yes	(35.32)	(132.15)	(204.24)	(305.29)	(369.54)	(443.69)
Abstinence No	(19.46)	(39.72)	(71.61)	(124.97)	(149.16)	(164.79)

¹ Measured as a percent of past 90 days² Measured since study entrance

Time between each wave is 6 months

Table 3

Longitudinal model of days abstinent, heavy drinking days and days since last drink

N = 271	Percent Days		Heavy Drinking		Days since Last	
	Abstinent β	Days SE	Drink β	SE	β	SE
Desire for abstinence	1.18	3.89	1.58	3.27	-23.20	37.14
Wave						
Wave 1	-	-	-	-	-	-
Wave 2	18.55**	3.78	-16.72**	3.48	18.48**	34.13
Wave 3	20.48**	3.83	-18.32**	3.53	46.32**	34.57
Wave 4	20.34**	3.83	-19.08**	3.53	101.80**	34.59
Wave 5	13.33**	3.86	-17.86**	3.56	125.94**	34.85
Wave 6	13.22**	3.88	-17.99**	3.58	143.77**	35.07
Desire for abstinenceXwave						
Wave 1	-	-	-	-	-	-
Wave 2	9.31*	4.22	-8.13*	3.89	72.33	38.11
Wave 3	5.94	4.28	-4.03	3.95	116.92**	38.67
Wave 4	6.44	4.29	-4.98	3.96	161.64**	38.84
Wave 5	9.96*	4.33	-5.06	3.99	202.57**	39.13
Wave 6	12.93**	4.38	6.26	4.03	256.25**	39.66
Site						
University outpatient	-	-	-	-	-	-
VA treatment program	-0.09	2.87	0.79	2.23	145.32**	28.34
Moderated drinking program	-25.79**	3.86	6.41*	2.99	-57.23*	38.23
Age	0.09	0.11	-0.17	0.09	4.12**	1.09
Gender						
Male	1.52	2.59	-1.87	2.01	18.38	25.65
Female	-	-	-	-	-	-
Race						
White	-	-	-	-	-	-
Black	1.72	4.45	2.16	3.45	9.22	44.01
Other	-1.98	6.37	1.88	4.94	-109.68	62.94
Education (in years)	-1.01*	0.51	0.14	0.39	1.39	5.40
Previous experience with AA	1.05	2.99	1.18	2.32	-0.28	29.48
Family history	-1.49	3.29	4.99*	2.55	12.17	32.45
Age of alcohol dependence onset	-0.26*	0.11	0.24**	0.08	-1.44	1.08
Short inventory of problems	-0.16	0.09	0.23**	0.08	0.78	0.98

*p<.05,

**
p<.01. Time between each wave is 6 months

¹Miller et al., 1995. The SIP is a 15-item measure about negative consequences of drinking, $\alpha = .91$