



Published in final edited form as:

*Addict Behav.* 2009 December ; 34(12): 1029–1035. doi:10.1016/j.addbeh.2009.06.015.

## 7-year trajectories of Alcoholics Anonymous attendance and associations with treatment

Lee Ann Kaskutas, Dr. P.H.<sup>1,2</sup>, Jason Bond, Ph.D.<sup>1</sup>, and Lyndsay Ammon Avalos, Ph.D.<sup>1</sup>

<sup>1</sup> Alcohol Research Group, Public Health Institute

<sup>2</sup> School of Public Health, University of California Berkeley

### Abstract

Although many members of Alcoholics Anonymous (AA) are introduced to AA during treatment, the relationship between treatment and AA attendance over time is unknown. This paper describes four latent classes of AA attendance among 586 dependent alcoholics interviewed by telephone 1, 3, 5 and 7 years after baseline, and models the relationship between treatment exposure and AA attendance in each class. There was a *low* AA group (averaging fewer than 5 meetings at most follow-ups), a *medium* AA group (about 50 meetings a year at each follow-up), a *descending* AA group (about 150 meetings year 1, then decreasing steeply), and a *high* AA group (about 200 meetings at 1 year, then decreasing gradually by year 7). Declines in meeting attendance were not always accompanied by decreases in abstinence. After accounting for the effect of time on AA attendance (i.e., the “ups-and-downs” that occur over time), treatment exposure was minimally related to AA attendance in all but the *descending* AA group, where it was negatively associated ( $p < .001$ ). Considering AA patterns over time highlights a different role for treatment in AA attendance than what is gleaned from analyses at single timepoints.

### Introduction

Most chemical dependency treatment programs recommend attendance at Alcoholics Anonymous (AA) as an ongoing source of support following treatment discharge (Humphreys, 1997; Roman & Blum, 1998), and data from AA’s most recent membership survey supports an important role for treatment in AA affiliation: Over 60% of AA members reported receiving some type of treatment or counseling before coming to AA (A.A. World Services, 2008). However, many (upwards of 40%; Kelly & Moos, 2003; R. Moos, Schaefer, Andrassy, & Moos, 2001; Tonigan, Connors, & Miller, 2003) drop-out of AA during the year following treatment, suggesting that treatment may have more of a role in getting people to AA than in keeping them there. In fact, those who tend to stay longer in AA appear to be those who attend AA first (rather than going first to treatment, and then being introduced to AA) (R. H. Moos & Moos, 2004). Since sustained meeting attendance is associated with better outcomes (R. H. Moos & Moos, 2005; Tonigan et al., 2003; Witbrodt et al., 2007), it is important to understand the role that treatment plays in patterns of AA involvement over time. This paper develops trajectories of AA attendance over a 7-year period among alcohol-dependent individuals

Address correspondence to: Lee Ann Kaskutas, Alcohol Research Group, 6475 Christie Avenue, Suite 400, Emeryville, CA 94608-1010, (510)597-3456, Fax (510)985-6459, lkaskutas@arg.org.

**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.

recruited from treatment programs and the general population, and studies the association between treatment exposure and the number of AA meetings attended over time.

While it is taken for granted that most treatment clients are both encouraged to attend AA and become motivated to do so via the treatment experience (Rudolf H. Moos & B. S. Moos, 2006; Rudolph H. Moos & Bernice S. Moos, 2006), there is little empirical evidence of treatment having an effect on long-term AA attendance. The best available work comes from Rudolf Moos' 16-year follow-up of initially untreated individuals, which found stronger effects on AA attendance for earlier but not later treatment episodes. In that study, the length of treatment received early on was significantly associated with AA meeting attendance over the next 2 years (R. H. Moos & Moos, 2004) and even 5 years thereafter (personal communication with Rudolf Moos, May 7, 2009), but treatment episodes experienced subsequently did not have a similar relationship with later AA attendance (R. H. Moos & Moos, 2004). As for drinking outcomes, independent effects were found for AA but not for treatment (Rudolf H. Moos & B. S. Moos, 2006). These findings suggest complex relationships among treatment, AA, and abstinence over time. This topic is pursued here, using a different analytic technique and sample.

The analytic approach used here, latent class growth analysis, empirically constructs prototypical patterns of AA meeting attendance (i.e., classes, groups, or trajectories of attendance) that best fit the collection of individual respondents' AA attendance as it changes over time. Our prior work on AA meeting trajectories (Kaskutas et al., 2005) reported four distinct classes of attendance in a treatment sample followed at 5 years: *low AA* attendance (almost none); *medium AA* (about 60 meetings a year, with an upswing suggested at year 5); *declining AA* following initially high attendance (about 200 meetings a year); and sustained *high AA* attendance (about 200 meetings a year, with a modest decline at year 5). The analysis presented in the current study expands on that work in several ways.

Most importantly, this new work estimates a parameter that reflects the influence of treatment on AA attendance after considering the effect of the passage of time in changing patterns of AA attendance. As noted above, evidence from treatment samples suggests that AA attendance rates often decline after treatment discharge and thereafter (Gossop et al., 2003; Kaskutas, Turk, Bond, & Weisner, 2003; Kelly & Moos, 2003; Thomassen, 2002; Tonigan et al., 2003), and that treatment sought later has weaker relationships with AA attendance than early treatment episodes (R. H. Moos & Moos, 2004), suggesting a need for including the effect of time on meeting attendance. Our statistical technique includes parameters for time, so that any ups, downs, or stability in attendance can be accounted for along with the influence of time. The variance in AA attendance that remains after "parsing out" the influence of the time trend can then be safely analyzed, here as a function of treatment attendance.

Secondly, it adds a general population sample of dependent alcoholics not treated in the year prior to recruitment, so that AA meeting trajectories can be constructed that more accurately reflect the AA membership: 40% of AA members report no prior treatment (Alcoholics Anonymous, 2001). It also includes the treatment sample used to develop the 5-year trajectories reported above, such that the overlap of respondents in both papers is 54% (i.e., 43% of those in the current paper were not included in the earlier work, and 3% of those in the earlier work are not included here).

Third, it includes those who never attended AA (excluded from prior work), so that the influence of treatment on AA attendance is not limited to those who attend at least some AA meetings: at least a quarter of those in treatment never go on to attend AA (Tonigan et al., 2003). Last, it extends the follow-up period to 7 years. We address these broad questions:

1. What are the patterns of AA attendance over 7 years, considering both treated *and untreated* dependent alcoholics? How do these patterns compare to what they looked like at 5 years, in only a treatment sample? What is the influence of time on AA attendance? Do the trajectories of AA attendance change much over time? Is the effect of time constant, or does it cause the trajectories to change at some point?
2. What about treatment? What is the relationship between treatment exposure and AA attendance over time? Is the relationship the same, regardless of one's pattern of AA attendance? Is treatment entry over time higher in any of the AA trajectories?
3. How do these AA trajectories relate to abstinence over time? Do higher levels of other AA activities help to further explain this relationship?

## Methods

### Sample

The study was conducted in a northern California county selected for its population and urban/rural heterogeneity and its similarity to many other counties in the US (C. Weisner & L. Schmidt, 1995). Two sampling procedures were utilized to produce the study population and have been described in detail elsewhere (Kaskutas, Weisner, & Caetano, 1997; Weisner & Matzger, 2002; Weisner, Matzger, Tam, & Schmidt, 2002). In-person interviews were conducted with individuals entering a county's public and private chemical dependency programs (the *treatment sample*) and with problem drinkers from the general county population (*general population sample*) who had not received treatment in the prior year.

Participants in the treatment sample (n=926) were recruited from the ten public and private treatment programs in the study county with at least one intake per week, whose focus was not primarily drug abuse or aftercare (Kaskutas et al., 1997). The overall recruitment percentage for the treatment sample was 80% (88% at public programs, 77% at private programs). The analyses here is limited to those who met criteria for alcohol dependence (see Measures) at baseline (n=470). Telephone follow-up interviews were conducted 1 year, 3 years, 5 years and 7 years later (with n=359, 347, 321, 292 dependent individuals interviewed at each respective follow-up).

Participants in the general population sample (n=672) were recruited via telephone interviews using random digit dialing methods with a probability sample of 13,394 individuals age 18 and over to screen for problem drinking criteria. Those who met problem drinking criteria and had not received alcohol or drug treatment during the previous 12 months were recruited for an in-person interview. To meet criteria for problem drinking, individuals reported at least two of the following during the previous 12 months: 1) drinking 5 or more drinks on an occasion at least once a month for men (3 drinks weekly for women), 2) 1 or more alcohol-related social consequences (from a list of 8), and 3) 1 or more alcohol dependence symptoms (from a list of 9). This measure of problem drinking (described more thoroughly in (Weisner, 1993) is consistent with the predominant approach taken in alcohol epidemiology research, and similar measures have been widely used in published studies (Institute of Medicine, 1990; Schmidt, Weisner, & Wiley, 1998; Weisner & Schmidt, 1992; C. Weisner & L. A. Schmidt, 1995; Wilsnack, Klassen, Schur, & Wilsnack, 1991). The recruitment rate was 70%. Of these, 120 individuals met criteria for alcohol dependence. Similar to the treatment sample, telephone follow-up interviews were conducted 1 year, 3 years, 5 years and 7 years later (respective n's of dependent individuals followed are 111, 109, 102, 100).

The current analysis considered individuals who met criteria for *alcohol dependence at baseline* (n=590) and whose data on AA and treatment exposure were available at one or more assessment (resultant n=586). Over the 7-year study period, 75% of these individuals had

attended at least one AA meeting, and 85% had gone to a formal treatment program at least once. The sample was 33% female, 46% non-white (31% black, 6% Hispanic, 9% other), and age 39 years (+/-11). About one-quarter did not have a high school education, only 22% reported incomes above \$50,000, and 30% were married/living together. Eighty percent were recruited in treatment programs (n=468), 20% from the general population (n=118). Compared to participants recruited in treatment, those in the general population sample were significantly younger (34 years vs. 40 years,  $p<.001$ ), their alcohol problems were less severe (mean ASI composites scores 0.35 +/-0.18 vs. 0.60 +/-0.25,  $p<.001$ ), fewer were non-white (36% vs. 48%,  $p=.03$ ), and more reported incomes above \$50,000 (37% vs. 19%,  $p<.001$ ).

## Measures

Alcohol dependence was developed from a checklist of questions based on criteria from the Diagnostic Interview Schedule for Psychoactive Substance Dependence, DSM-IV (American Psychiatric Association, 2000) that has been used in numerous other studies (Caetano & Rasberry, 2000; Humphreys & Weisner, 2000; Weisner, Conell et al., 2000; Weisner, Mertens et al., 2000; Weisner, Mertens, Parthasarathy, & Moore, 2001). Problem severity was measured using the Addiction Severity Index/ASI (McLellan, 2000) which measures problems in seven domains: alcohol, drugs, physical health, mental health, family/social, legal, and employment.

Two primary measures in the survey instrument most relevant to the current analysis reflect behavior which occurred within the 12 months prior to each interview: the number of AA meetings attended; and whether or not the respondent attended specialty alcohol treatment. Abstinence was studied for the past 12 months and the past 30 days. Past-year abstinence was assessed using the graduated frequency series which asks about the quantity and frequency of drinking over the past 12 months (Clark & Hilton, 1991). Recent alcohol consumption was ascertained from the ASI alcohol domain. The respective drinking measures were dichotomized to yield measures of abstinence status at each follow-up for the past 12 months and the past 30 days.

Three additional items are studied that capture beliefs and activities relevant to AA. Two come from the AA Affiliation Scale (Humphreys, Kaskutas, & Weisner, 1998) and assess whether the respondent currently has an AA sponsor, and considers himself/herself an AA member. The third item comes from the Religious Beliefs and Behaviors scale used in Project MATCH (Connors, Tonigan, & Miller, 1996), which asks whether the respondent considers himself/herself as religious, spiritual, unsure, atheist, or agnostic.

## Analysis

Latent class trajectories (Muthén & Muthén, 2000), or careers, of AA attendance across the five interview periods were estimated using MPLUS version 4 (Muthén, 2004). SPSS v.12 was used to calculate the mean number of AA meetings attended, treatment exposure, and abstinence at each time period by each AA career.

Two growth curves were estimated for each class. The first is a dichotomous process representing the probability that the respondent could only report zero AA meetings. The second process estimated is the growth model for the count of the number of AA meetings attended, conditional on having attended AA at all. Within AA career  $k$ , the growth model of the count process is represented as:

$$\ln(\lambda_{i,t}^k) = \mu^k + \theta_1^k t + \theta_2^k t^2 + \gamma^k z_{i,t}^k$$

where  $i$  indexes individual,  $t$  indexes period of measurement, and  $z$  represent whether any specialty alcohol treatment was attended by respondent  $i$  at time  $t$  who falls into class  $k$ . The parameter  $\lambda$  represents the mean of a zero-inflated Poisson count process, estimated using a Poisson regression model. The latent class growth model was estimated assuming  $k = 2, 3, 4, 5,$  and  $6$  classes. Selection among models with different numbers of classes were guided primarily by the Bayesian Information Criteria (BIC) along with substantive judgments based on resulting sample sizes within groups and the interpretability of the resultant trajectories (e.g., in cases when two trajectories were very similar, choosing a model with one fewer class). Latent class growth modeling recognizes homogeneous groups and allows analysts to estimate the growth parameters within groups, including the effect of treatment over time. Thus, with this technique, a covariate (in our case, treatment status) can be understood as potentially influential both *in constructing the trajectories* and *in predicting the dependent variable upon which the trajectory groupings (classes) are based*.

## Results

### AA meeting trajectories

The four-class solution was chosen, based on: consideration of the BIC (lower BIC preferred: the 2-class solution BIC = 63505; 3-class BIC = 53273; 4-class BIC = 47157; 5-class BIC = 43654; 6-class BIC = 41095); the distribution (for stability, and to allow cross-tabulation with variables of interest, we required at least 5% of the sample in a group, a condition not satisfied in the 6-class solution); the interpretability of the curves (e.g., the groups needed to be distinct: entropy = .727, suggesting moderate-to-high distinction); and the stability of the group assignments (i.e., low probability of being in a group other than the one assigned; Table 1). In both the 3- and 4-class solutions, a *high AA* group, a *descending AA* group, and a *low AA* trajectory obtained, suggesting some stability in the underlying growth curves. In the 5-class solution, the *descending AA* group split into two descending groups that essentially only varied on their initial level of AA attendance at baseline.

The four trajectories of meeting attendance (shown in Figure 1) could be described as consisting of: (1) a *low AA* group (the largest group,  $n=371$ ) whose members reported, on average, less than 5 meetings at most follow-ups; (2) a *medium AA* group ( $n=90$ ) who had attended about 50 AA meetings in the year prior to each follow-up; (3) a *descending AA* group ( $n=67$ ) whose high attendance at the 1-year follow-up declined steeply but then seemed to stabilize; and (4) a *high AA* group ( $n=58$ ) whose high attendance declined steadily.

Individuals were assigned to the group for which they had the highest probability of membership. As shown in Table 1, the average posterior probability of being in a group other than the one actually assigned was below 5% for all but the *low AA* group, where that probability exceeded 20%. For example, respondents assigned to the *low AA* group had a 6% to 7% probability of membership in the *high AA* and *descending AA* groups, respectively, and almost a 10% probability of membership in the *medium AA* group. This indicates drift of individuals across groups, or a measure of the uncertainty to which individuals are assigned to groups similar to entropy, which is a single measure based upon these posterior probabilities. For the other classes, comparable probabilities of membership in groups other than the one to which they had been assigned ranged from only 0.3% to 2.0%.

Statistical tests (results shown in Table 2) were conducted to determine whether treatment in the past 12 months significantly related to the number of meetings attended in the past 12 months (the treatment parameter), whether the estimated latent trajectory of AA meetings showed significant change up or down over time (linear parameter), and whether the change departed from a straight line (quadratic parameter). All but two parameters were significant. The linear and quadratic parameters indicate that average AA attendance over time is not

constant: for each trajectory of attendance, at some point it changes course. It is worth noting that the difference in sign for the time coefficients across the AA career groupings reflects the shape of the curvature in the trend of AA meeting attendance over time. For example, the sign for the quadratic term is negative for all four AA careers, and the magnitudes are small, reflected in the slight “concave down” (opposite of U-shaped) shape in the curves. The sign for the linear term is negative for the *descending AA* group, and is positive for the others, which tracks with the steep decline shown for AA meetings in that group.

As noted above, with this modeling technique, a covariate such as treatment status not only is studied in relationship to the dependent variable upon which the latent groups are based (here, number of AA meetings in the past year); it also enters into the construction of the trajectories. Treatment had a significant, but quite small, positive relationship with the number of AA meetings attended in the *high AA* group. Among the *descending AA* group there was a significant inverse (negative) relationship of large magnitude (discussed further below). The coefficients for treatment were not significant in the *low AA* and *medium AA* groups.

For all four trajectories, AA attendance increased from baseline to the year 1 follow-up, with the increase steepest for the *high AA* and *descending AA* groups. From there, it decreased, except for the *medium AA* group whose attendance levels were rather stable after that.

We examined the make-up of the four classes by demographics (gender, ethnicity, education, income, marital status, age, religious belief), study sample, and baseline ASI problem severity (results not shown). Only one significant ( $p < .05$ ) baseline demographic difference was found in the make-up of the AA meeting trajectories: 22% of the members of the *low AA* group were in the combined belief group of atheists, agnostics, and those unsure of their religious belief, compared to 17% of the *high AA* group, 12% of the *medium AA* group, and 10% of the *descending AA* group. A significantly higher proportion of the *low AA* group came from the general population sample (29%), while 94%–97% of those in the other trajectory groupings came from the treatment sample. At baseline, the *low AA* group had significantly lower alcohol problems than the *medium AA* and *high AA* groups, and less severe drug problems than the *medium AA* group. No other ASI problem domains emerged as significantly different between the four trajectory groups.

### AA attendance and treatment attendance

Treatment exposure for each AA trajectory is shown in Figure 2. Everyone in the treatment sample (which was recruited from treatment programs) is shown as having attended treatment at baseline; conversely, none of the general population sample attended treatment at baseline (as noted in the methods, receipt of treatment in the past 12 months was an exclusion criteria for the general population sample). Note that lifetime rates for treatment exposure prior to study entry (and prior to the index treatment, for those in the treatment sample) were quite high, over 50% even for the *low AA* group (which included 89% of the general population sample), and about three-quarters in the other three AA trajectories (Figure 2, far left data point labeled ‘prior to baseline’). Exposure to treatment in the 12 months prior to the 1-year, 3-year, 5-year, and 7-year interviews declined after baseline. Treatment does not strongly track with AA meeting trajectories, although the *low AA* group tends to have the lowest treatment rates over time.

### AA trajectories and abstinence

AA meeting attendance tracked minimally with abstinence rates (Figure 3). Abstinence rates tended to be lowest among the *low AA* group, and highest among the *high AA* group. However, the steep initial decrease in attendance in the *descending AA* group did not correspond with sharp reductions in abstinence rates at later follow-ups. Similarly, the gradual decline in AA

attendance in the *high AA* group was not associated with a parallel decline in abstinence, although their abstinence rates did decrease between years 1 and 5. For both the *high AA* and the *descending AA* groups, abstinence rates increased a bit at year 7, such that three-quarters in each group reported abstinence for the 30 days prior to the year 7 interview. Conversely, past 30-day abstinence rates hovered around 30% between the 1- and 7-year follow-ups for the *low AA* group, and at about 60% for the *medium AA* group. The pattern of results was similar using 12-month abstinence, but the abstinence rates were much lower, especially by year 7 (results not shown).

### Post-hoc analyses

Several analyses were conducted to clarify our findings, including consideration of AA activities and treatment exposure at each study interview among the four AA meeting trajectories (results not shown). For example, we thought that higher levels of AA activities among the *descending AA* and *high AA* groups might help to explain why they have such strong abstinence rates (about three-quarters) by year 7. Among the *high AA* group at year 7, almost half (46%) had a sponsor, nearly three-quarters (74%) had helped newcomers, and still more (80%) considered themselves members of AA. The corresponding rates for the *descending AA* group were 35%, 44%, and 74% respectively--fairly high, but with fewer having a sponsor or helping newcomers. We next looked at AA activities among the *medium AA* group. At year 3, the proportion who had a sponsor, and who had helped newcomers, was approximately one-third; and these rates did not decline much by year 7. Two-thirds said they considered themselves a member of AA at baseline, as did about half of the group at the 3-, 5-, and 7-year interviews. The stable rate of abstinence (60% at year 7) in the *medium AA* group may be explained by a convergence of modest but steady meeting attendance and other AA-prescribed activities, against a backdrop of a sense of belonging in AA.

Since a positive relationship between treatment exposure and AA attendance is generally expected, we conducted additional analyses in an attempt to determine whether our results (of a negative relationship between treatment and AA in the *descending AA* group) might be driven by the statistical technique we used. To understand how the latent class growth curve approach might be affecting our results, we considered the relationship between past-year treatment and past-year AA attendance at each interview, which does not take into account the effect that time has on AA attendance (unlike latent class growth curve models, in which time is included as a predictor). Among the *descending AA* group, this relationship was only significant at baseline; at years 1 and 3, the relationships were null; and they were marginally significant at years 5 and 7. Thus, among the *descending AA* group, the relationship between treatment in a given year and AA meeting attendance the same year was minimal. But when studied longitudinally and against the backdrop of a very strong negative linear effect for time, treatment had a strong negative relationship with the number of AA meetings attended over time. This tells us that the negative coefficient for treatment and AA which emerged among the *descending AA* group, did so because the method used here simultaneously took into account the effect of time on the shape of that group's AA meeting trajectory. Attendance was quite high at year 1, but decreased steeply by year 3, then stabilized; once that pattern was accounted for, the separate relationship between treatment and meeting attendance over time was negative.

In contrast, for the other trajectory groups, the number of AA meetings at each interview was significantly higher for those who had reported treatment that same year. But over time, the relationship between treatment exposure and AA meetings was minimal.

One final post-hoc analysis looked at treatment entry over time in the four trajectory groups. Treatment entry post baseline was highest in the *descending AA* group (81%), followed by the *high AA* group (59%), the *medium AA* group (50%), and the *low AA* group (31%). This helps

provide further context for interpreting the negative coefficient for treatment and AA meeting attendance in the descending AA group, discussed below.

## Discussion

The AA meeting attendance trajectories observed in the combined sample by year 7 help to clarify those previously reported using only the treatment sample data through year 5 (Kaskutas et al., 2005). In both analyses, there was evidence of a *low AA* group, a *medium AA* group, a *descending AA* group, and a *high AA* group. It is noteworthy that such similar latent classes of AA attendance patterns obtained when we added the general population sample, and that a new, different pattern of AA attendance did not emerge. This suggests some robustness for these four meeting trajectories as potentially representative of “typical” AA attendance patterns over time. This is a topic warranting replication with additional samples and mixes of problem severity and treatment-seeking histories.

Given the similarities in patterns of AA attendance between our earlier work and the current analysis, it is interesting to consider whether the distribution of individuals across the trajectories also is similar. While the proportions of participants in the *medium AA* and the *descending AA* groups are very similar, there were relatively more individuals in the *low AA* group (63% vs. 50%) and fewer in the high AA group (10% vs. 20%) in the current analysis than in the prior work with the treatment sample only. This likely is a reflection of lower alcohol problem severity in the general population sample included in the current study, many of whom were in the *low AA* group.

The addition of another timepoint allowed us to see shapes in the trajectories that had only been hinted at by year 5. For example, one of the trends suggested by year 5 in the earlier work, of a modest decline in attendance for the *high AA* group, became apparent and pervasive in the 7-year data. However, the suggestion of an upswing in attendance for the *medium AA* group was not sustained at year 7. These findings reinforce the oft-repeated call for long-term follow-up studies in our field.

### AA meeting trajectories and abstinence

The early steep decline in attendance among the *descending AA* group, and the more gradual decline in the *high AA* group, did not correspond with parallel decreases in abstinence rates in the groups over time. In fact, the relatively stable (and rather high) abstinence rates among the *descending AA* group call into question the notion that lifelong high meeting attendance levels are required, while the fairly comparable rates of abstinence among the *high AA* group suggests that this group may need the higher number of meetings (and activities) to achieve a similar rate of abstinence.

These companion findings may not be as counterintuitive as they seem at first. For example, it seems reasonable that initially high doses of attendance may sufficiently inculcate an abstemious lifestyle for some dependent alcoholics. It appears that the *high AA* group had correctly judged their need for heavy meeting attendance and activities early on, which is why their meeting attendance did not decline steeply (as it did for the *descending AA* group). This phenomenon may help to engender (and explain) the view heard frequently among AA members that decreasing one’s meeting attendance can be dangerous, even for “old-timers” with a number of years of abstinence “under their belt.” In contrast, the *descending AA* group (with the highest treatment rates at follow-ups) seems to have substituted treatment for AA. Finally, the modest but initially stable meeting attendance of the *medium AA* group (averaging not quite 1 meeting a week at the follow-ups), and their corresponding stable abstinence rates over time, suggest that there is another category of AA attender who is able to “get what they



need from AA” without high initial levels of attendance, but with sustained moderate attendance. This remains a very interesting group for further study.

### AA meeting trajectories and treatment

The negative relationship between treatment and AA attendance observed in the *descending* AA group was not expected. Ours is the first study we know of that has reported this, although other studies have not looked at how treatment relates to AA attendance while allowing treatment to simultaneously influence patterns of attendance over time. The result might suggest that, for the *descending* AA group, treatment was being replaced by AA meetings, and vice versa—that meetings were being replaced by AA. Although explicit substitution of AA for treatment may not be the underlying mechanism at work, the relatively strong inverse association that was found argues for some type of influence, either measured or unmeasured, that trends these two activities in opposite directions.

Moos and Moos (2004) also have observed a “substitution effect of AA for treatment” (p. 172) in their data, and have argued that referrals to AA have more effect at the first treatment episode; over time, one’s own experience with AA becomes the determining factor (R. H. Moos & Moos, 2004; also see Humphreys & Moos, 2001). Using latent class models, we come to similar conclusions in particular AA trajectories. Among those whose AA attendance over time was best characterized as sharply descending, our evidence suggests a substitution effect. For the other three patterns of AA attendance, there was little evidence of a relationship between treatment exposure and AA attendance over time.

### Limitations

This paper has two key limitations that arise from the available measures. First, we do not have data on treatment, AA attendance, and alcohol consumption during years 2, 4, and 6 of this 7-year longitudinal study. It is possible, likely even, that events and behaviors those years were associated with behavior years 3, 5 or 7, resulting in incorrectly attributing relationships for events those years instead of events during the interim years. For example, treatment years 2 and 3 both may likely be associated with AA year 3, but treatment year 2 more so, in which case some of the relationship between year 2 treatment and AA trajectories would be attributed to treatment year 3, so that the association with treatment year 3 would be over-estimated.

Most importantly, we cannot draw conclusions regarding causation. The relative timing of treatment exposure and meeting attendance within a given 12-month period is unknown. For example, some (or all) of a respondent’s AA meeting attendance a given year may have come before, not after, going to treatment that year. However, the focus of our analysis here is on *the relationship between treatment exposure and the overall pattern of AA attendance over time*, rather than the effect of treatment on AA for any single year. In addition, temporal ordering of events is simply a necessary (but not sufficient) condition for establishing causality, as the causal processes of treatment-going and AA attendance over time can easily be thought of as part of a feedback loop.

### Conclusions

In summary, these results suggest four distinct and robust patterns of AA attendance over time—low, medium, initially high with steep decline, and initially high with gradual decline—with little evidence of a strong relationship between treatment exposure and patterns of AA attendance. If indeed treatment episodes over time have a somewhat minimal relationship with long-term AA attendance, and it is one’s experience at meetings and with the AA fellowship that interacts with an internal assessment of the amount of support from AA that is needed to sustain abstinence and recovery, then the practical implication is that providers should do everything they can to help clients come away with a positive assessment of AA. This includes

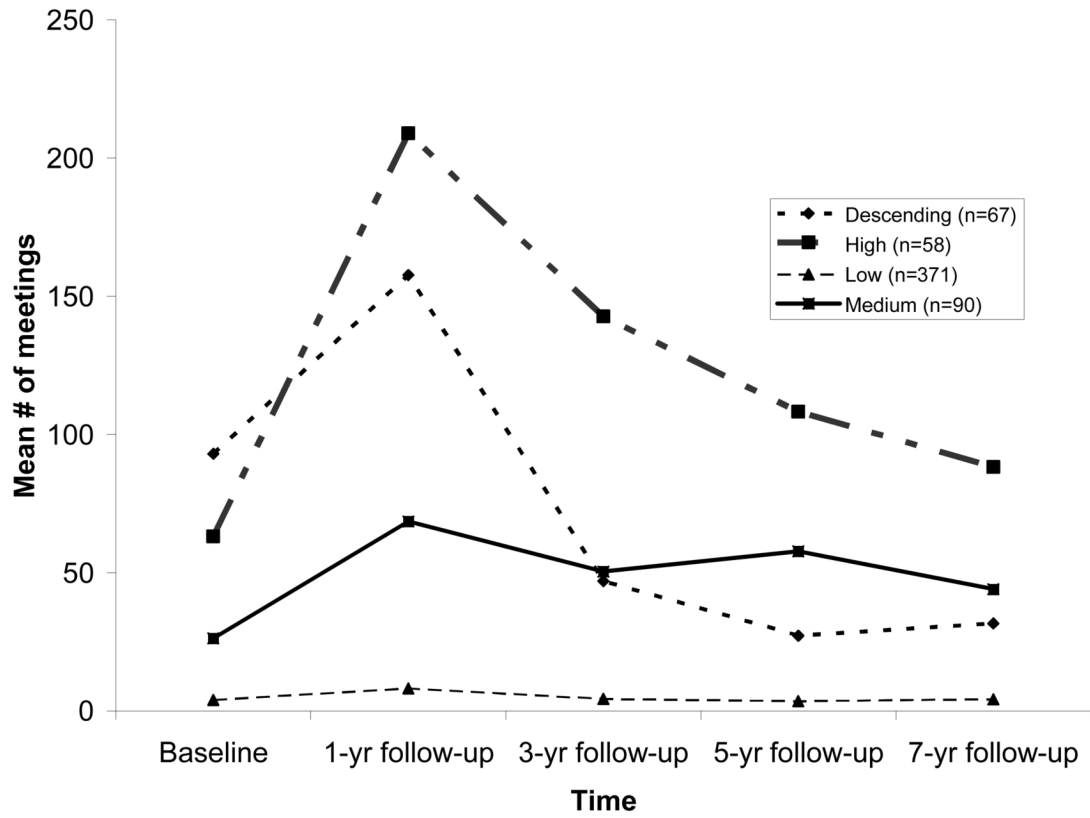
preparing clients realistically for what (and whom) they will encounter in AA, explaining the type of support that they will receive there, and helping them know how to ask for that support. Several 12-step facilitation approaches are available for this purpose, including the group format MAAEZ intervention (Making AA Easier; Kaskutas, Subbaraman, Witbrodt, & Zemore, in press), the individual format TSF intervention from Project MATCH (Nowinski, Baker, & Carroll, 1992), and the Intensive Referral approach (Timko & Debenedetti, 2007).

## References

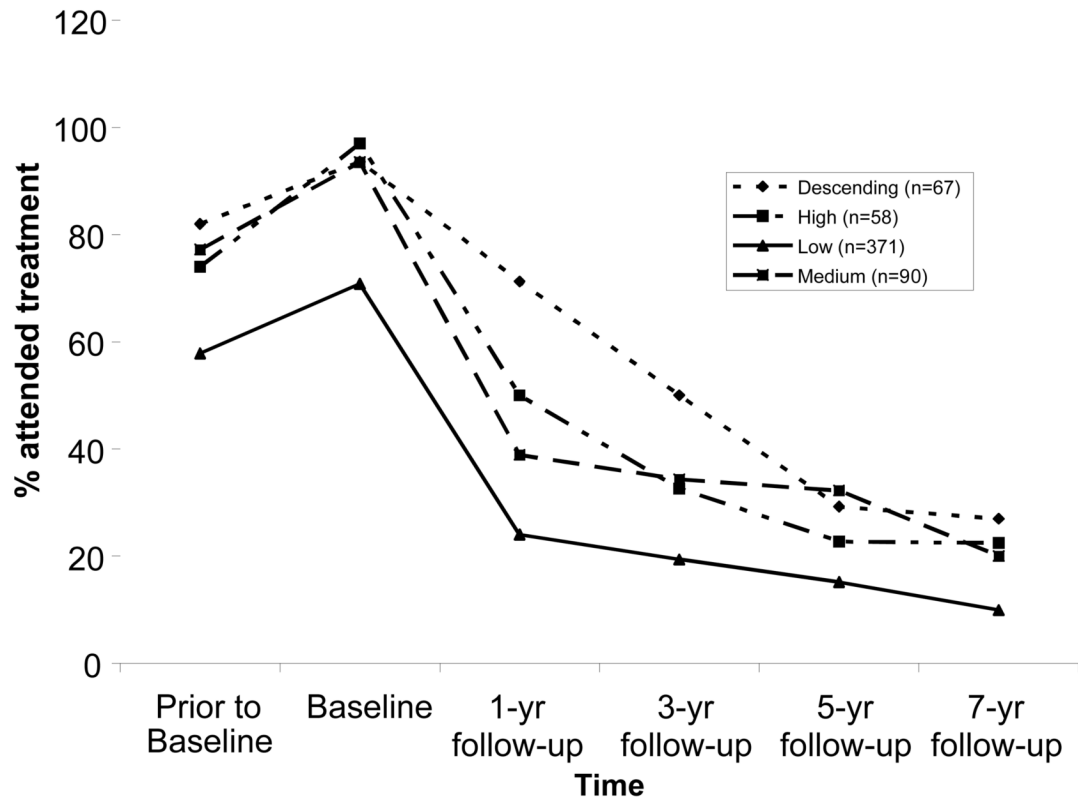
- A.A. World Services. Alcoholics Anonymous 2007 Membership Survey. New York, NY: A.A. World Services; 2008.
- Alcoholics Anonymous. Alcoholics Anonymous 1998 Membership Survey. New York, NY: Alcoholics Anonymous; 2001.
- American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Text Revision [DSM-IV-TR]. Vol. 4. Washington, D.C: American Psychiatric Association; 2000.
- Caetano R, Raspberry K. Drinking and DSM-IV alcohol and drug dependence among white and Mexican American DUI offenders. *Journal of Studies on Alcohol* 2000;61(3):420–426. [PubMed: 10807213]
- Clark, WB.; Hilton, ME., editors. Alcohol in America: drinking practices and problems. Albany, NY: State University of New York Press; 1991.
- Connors GJ, Tonigan JS, Miller WR. A measure of religious background and behavior for use in behavior change research. *Psychology of Addictive Behaviors* 1996;10(2):90–96.
- Gossop M, Harris J, Best D, Man LH, Manning V, Marshall J, et al. Is attendance at Alcoholics Anonymous meetings after inpatient treatment related to improved outcomes? A 6-month follow-up study. *Alcohol and Alcoholism* 2003;38(5):421–426. [PubMed: 12915517]
- Humphreys K. Clinicians' referral and matching of substance abuse patients to self-help groups after treatment. *Psychiatric Services* 1997;48(11):1445–1449. [PubMed: 9355173]
- Humphreys K, Kaskutas LA, Weisner C. The Alcoholics Anonymous Affiliation Scale: development, reliability, and norms for diverse treated and untreated populations. *Alcoholism: Clinical and Experimental Research* 1998;22(5):974–978.
- Humphreys K, Moos RH. Can encouraging substance abuse patients to participate in self-help groups reduce demand for health care? A quasi-experimental study. *Alcoholism: Clinical and Experimental Research* 2001;25(5):711–716.
- Humphreys K, Weisner C. Use of exclusion criteria in selecting research subjects and its effect on the generalizability of alcohol treatment outcome studies. *American Journal of Psychiatry* 2000;157(4):588–594. [PubMed: 10739418]
- Institute of Medicine. Broadening the Base of Treatment for Alcohol Problems. Washington, D.C: National Academy Press; 1990.
- Kaskutas LA, Ammon LN, Delucchi K, Room R, Bond J, Weisner C. Alcoholics Anonymous careers: patterns of AA involvement five years after treatment entry. *Alcoholism: Clinical and Experimental Research* 2005;29(11):1983–1990.
- Kaskutas LA, Subbaraman M, Witbrodt J, Zemore SE. Effectiveness of Making Alcoholics Anonymous Easier (MAAEZ), a group format 12-step facilitation approach. *Journal of Substance Abuse Treatment*. (in press)
- Kaskutas LA, Turk N, Bond J, Weisner C. The role of religion, spirituality and Alcoholics Anonymous in sustained sobriety. *Alcoholism Treatment Quarterly* 2003;21(1):1–16.
- Kaskutas LA, Weisner C, Caetano R. Predictors of help seeking among a longitudinal sample of the general population, 1984–1992. *Journal of Studies on Alcohol* 1997;58(2):155–161. [PubMed: 9065893]
- Kelly JF, Moos RH. Dropout from 12-step self-help groups: prevalence, predictors, and counteracting treatment influences. *Journal of Substance Abuse Treatment* 2003;24:241–250. [PubMed: 12810145]
- McLellan, AT. Addiction Severity Index (ASI). In: Rush, AJ., Jr; Pincus, HA.; First, MB.; Blacker, D.; Endicott, J.; Keith, SJ.; Phillips, KA.; Ryan, ND.; Smith, GR., Jr; Tsuang, MT.; Widiger, TA.; Zarin, DA., editors. *Handbook of Psychiatric Measures*. Washington, DC: American Psychiatric Association; 2000. p. 472-474.

- Moos R, Schaefer J, Andrassy J, Moos B. Outpatient mental health care, self-help groups, and patients' one-year treatment outcomes. *Journal of Clinical Psychology* 2001;57(3):273–287. [PubMed: 11241359]
- Moos RH, Moos BS. Help-seeking careers: connections between participation in professional treatment and Alcoholics Anonymous. *Journal of Substance Abuse Treatment* 2004;26:167–173. [PubMed: 15063909]
- Moos RH, Moos BS. Paths of entry into Alcoholics Anonymous: consequences for participation and remission. *Alcoholism: Clinical and Experimental Research* 2005;29(10):1858–1868.
- Moos RH, Moos BS. Participation in treatment and Alcoholics Anonymous: a 16-year follow-up of initially untreated individuals. *Journal of Clinical Psychology* 2006;62(6):735–750. [PubMed: 16538654]
- Moos RH, Moos BS. Treated and untreated individuals with alcohol use disorders: rates and predictors of remission and relapse. *International Journal of Clinical Health Psychology* 2006;6(3):513–526.
- Muthén, B. Latent variable analysis: growth mixture modeling and related techniques for longitudinal data. In: Kaplan, D., editor. *The Sage Handbook of Quantitative Methodology for the Social Sciences*. Newbury Park, CA: Sage Publications; 2004. p. 345–368.
- Muthén B, Muthén LK. Integrating person-centered and variable-centered analyses: growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research* 2000;24(6):882–891.
- Nowinski, J.; Baker, S.; Carroll, K. Twelve step facilitation therapy manual: a clinical research guide for therapists treating individuals with alcohol abuse and dependence [Project MATCH monograph series/DHHS publication, no. (ADM) 92–1893]. Vol. 1. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism; 1992.
- Roman, PM.; Blum, TC. National Treatment Center Study. Athens, GA: Institute of Behavioral Research, University of Georgia; 1998.
- Schmidt L, Weisner C, Wiley JA. Substance abuse and the course of welfare dependency. *American Journal of Public Health* 1998;88(11):1616–1622. [PubMed: 9807526]
- Thomassen L. AA utilization after introduction in outpatient treatment. *Substance Use and Misuse* 2002;37(2):239–253. [PubMed: 11863278]
- Timko C, Debenedetti A. A randomized controlled trial of intensive referral to 12-step self-help groups: one-year outcomes. *Drug and Alcohol Dependence* 2007;90:270–279. [PubMed: 17524574]
- Tonigan, JS.; Connors, GJ.; Miller, WR. Participation and involvement in Alcoholics Anonymous. In: Babor, TF.; del Boca, FK., editors. *Treatment Matching in Alcoholism*. New York, NY: Cambridge University Press; 2003. p. 184–204.
- Weisner C. Toward an alcohol treatment entry model: a comparison of problem drinkers in the general population and in treatment. *Alcoholism: Clinical and Experimental Research* 1993;17(4):746–752.
- Weisner C, Conell C, Hunkeler E, Rice D, McLellan AT, Hu TW, et al. Drinking patterns and problems of the 'stably insured': a study of the membership of an health maintenance organization. *Journal of Studies on Alcohol* 2000;61(1):121–129. [PubMed: 10627105]
- Weisner C, Matzger H. A prospective study of the factors influencing entry to alcohol and drug treatment. *Journal of Behavioral Health Services and Research* 2002;29(2):126–137. [PubMed: 12032970]
- Weisner C, Matzger H, Tam TW, Schmidt L. Who goes to alcohol and drug treatment? Understanding utilization within the context of insurance. *Journal of Studies on Alcohol* 2002;63(6):673–682. [PubMed: 12529067]
- Weisner C, Mertens J, Parthasarathy S, Moore C, Hunkeler E, Hu TW, et al. The outcome and cost of alcohol and drug treatment in an HMO: day hospital versus traditional outpatient regimens. *Health Services Research* 2000;35(4):791–812. [PubMed: 11055449]
- Weisner C, Mertens J, Parthasarathy S, Moore C. Integrating primary medical care with addiction treatment: a randomized controlled trial. *The Journal of the American Medical Association* 2001;286(14):1715–1723.
- Weisner C, Schmidt L. Gender disparities in treatment for alcohol problems. *The Journal of the American Medical Association* 1992;268(14):1872–1876.
- Weisner C, Schmidt L. The Community Epidemiology Laboratory: studying alcohol problems in community-and agency-based populations. *Addiction* 1995;90(3):329–342. [PubMed: 7735018]

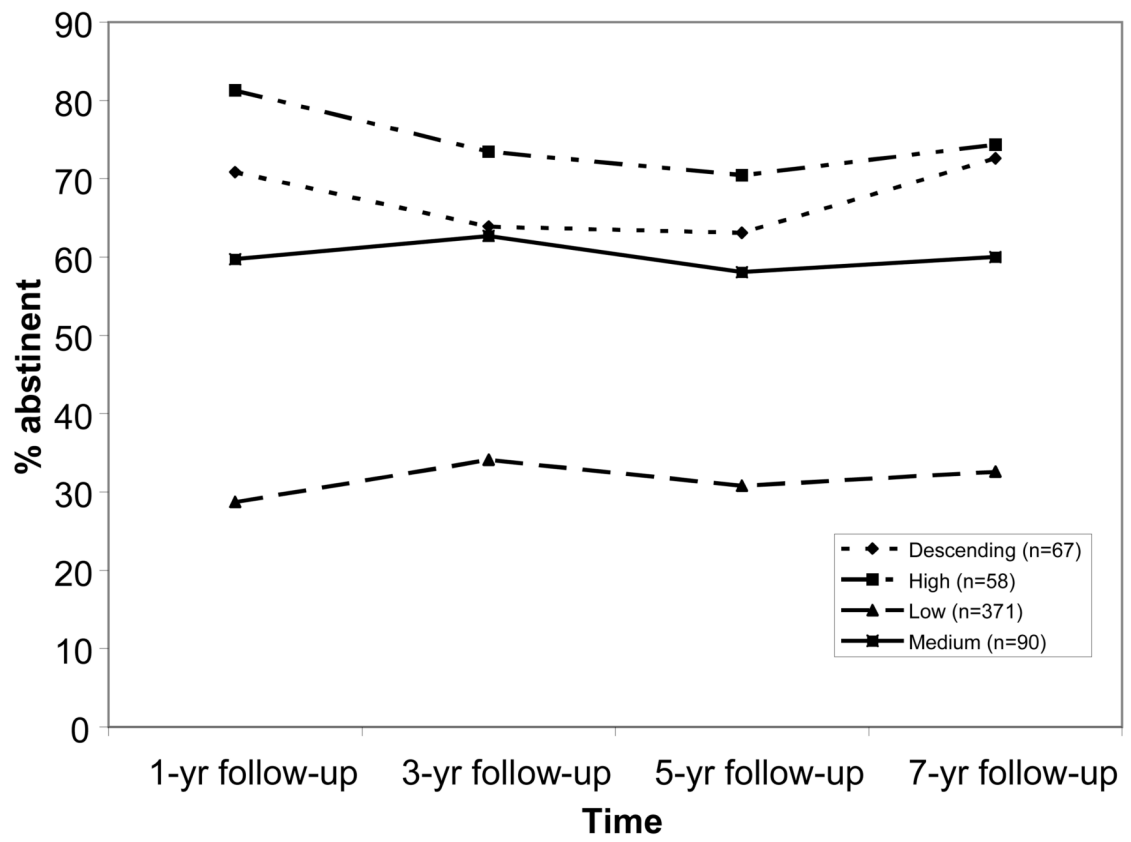
- Weisner C, Schmidt LA. Expanding the frame of health services research in the drug abuse field. *Health Services Research* 1995;30(5):707–727. [PubMed: 8537228]
- Wilsnack SC, Klassen AD, Schur BE, Wilsnack RW. Predicting onset and chronicity of women's problem drinking: a five-year longitudinal analysis. *American Journal of Public Health* 1991;81(3):305–318. [PubMed: 1994739]
- Witbrodt J, Bond J, Kaskutas LA, Weisner C, Jaeger G, Pating D, et al. Day hospital and residential addiction treatment: randomized and nonrandomized managed care clients. *Journal of Consulting and Clinical Psychology* 2007;75(6):947–959. [PubMed: 18085911]



**Figure 1.**  
Mean Number of AA Meetings by Group and Time



**Figure 2.**  
Treatment Exposure Rates by Group and Time



**Figure 3.**  
30-day Alcohol Abstinence Rates by Group and Time

**Table 1**

Mean posterior probability of latent profile group membership (column) within latent profile assignment (row)

	<b>Descending</b>	<b>High</b>	<b>Low</b>	<b>Medium</b>
Descending	<b>0.967</b>	0.009	0.016	0.008
High	0.020	<b>0.961</b>	0.004	0.014
Low	0.070	0.063	<b>0.770</b>	0.097
Medium	0.003	0.009	0.012	<b>0.976</b>



**Table 2**

Model parameters for initial AA meeting level (intercept), time (linear and quadratic) and treatment in each latent group (n = 586)

Group (% of sample)	Parameter	Estimate	Standard	Significance
Descending AA (11%)	Intercept	5.454	0.003	<0.001
	Linear	-0.302	0.002	<0.001
	Quadratic	-0.006	0.000	<0.001
	Treatment	-0.369	0.002	<0.001
High AA (10%)	Intercept	4.707	0.002	<0.001
	Linear	0.502	0.002	<0.001
	Quadratic	-0.070	0.000	<0.001
	Treatment	0.038	0.000	<0.001
Low AA (63%)	Intercept	2.549	0.006	<0.001
	Linear	0.258	0.004	<0.001
	Quadratic	-0.022	0.001	<0.001
	Treatment	0.002	0.004	<0.612
Medium AA (16%)	Intercept	3.640	0.003	<0.001
	Linear	0.536	0.002	<0.001
	Quadratic	-0.058	0.000	<0.001
	Treatment	0.000	0.001	<0.992