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The Importance of Age composition of 12-step meetings as a moderating factor in the relation between young adults' 12-step participation and abstinence

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Abstract

Background: Participation in 12-step mutual help organizations (MHO) is a common continuing care recommendation for adults; however, little is known about the effects of MHO participation among young adults (i.e., ages 18-25 years) for whom the typically older age composition at meetings may serve as a barrier to engagement and benefits. This study examined whether the age composition of 12-step meetings moderated the recovery benefits derived from attending MHOs.

Method: Young adults ($N=302$; 18-24 yrs; 26% female; 94% White) enrolled in a naturalistic study of residential treatment effectiveness were assessed at intake, and 3, 6, and 12 months later on 12-step attendance, age composition of attended 12-step groups, and treatment outcome (Percent Days Abstinent [PDA]). Hierarchical linear models (HLM) tested the moderating effect of age composition on PDA concurrently and in lagged models controlling for confounds.

Results: A significant three-way interaction between attendance, age composition, and time was detected in the concurrent ($p=0.002$), but not lagged, model ($b=0.38$, $p=0.46$). Specifically, a similar age composition was helpful early post-treatment among low 12-step attendees, but became detrimental over time.

Conclusions: Treatment and other referral agencies might enhance the likelihood of successful remission and recovery among young adults by locating and initially linking such individuals to age appropriate groups. Once engaged, however, it may be prudent to encourage gradual integration into the broader mixed-age range of 12-step meetings, wherein it is possible that older members may provide the depth and length of sober experience needed to carry young adults forward into long-term recovery.

Keywords

young adults; 12-step groups; substance use

1. INTRODUCTION

In most industrialized nations, young adulthood (i.e., ages 18-25yrs) represents a transitional developmental stage characterized by increased social and political autonomy, independent living, and greater financial resources (Arnett, 2000, 2005). The required adaptations

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necessary to successfully negotiate these new challenges and responsibilities carry with them inherent stresses and risks (Arnett, 2005; Chan et al., 2008). Across the life course, for example, the highest rates of psychological distress occur during young adulthood, and rates of alcohol and other drug use and related disorders are higher than at any other time across the life course (Substance Abuse and Mental Health Services Administration (SAMHSA), 2012). For young adults seeking recovery from substance use disorder (SUD) this has important implications, because it may be more challenging to find low-risk, substance free, social environments or obtain specific peer-support to aid recovery efforts (Kelly et al., 2008, 2012).

Twelve-step mutual help organizations (MHOs), such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), are a ubiquitous and easily accessible, recovery-specific community resource that may provide recovery-specific support and new social connections that can facilitate substance free pleasurable social activities for young adults (Kelly et al., 2008; Passetti et al., 2012). A rapidly growing research literature has demonstrated a significant positive effect of 12-step MHO participation in increasing abstinence and long-term remission among adults (Bond et al., 2003; Emrick et al., 1993; Kaskutas, 2009; Kelly et al., 2006; Moos and Moos, 2006; Timko et al., 2000; Tonigan et al., 1996; Vaillant, 1983), but only a handful of studies have been conducted among young adults. While these suggest that this age group can attend at high rates during and following SUD treatment and show significant related recovery benefit (Delucchi et al., 2008; Kelly et al., 2012) compared to older adults, young adults may face additional developmentally-related barriers to MHO participation because the majority of AA and NA members, on average, are substantially older. According to the 2011 AA Membership Survey (Alcoholics Anonymous World Services, 2011) and the 2011 NA Membership Survey (Narcotics Anonymous World Services, 2011), for instance, a majority of AA (51%) and NA (59%) members are between the ages of 41 and 60 years; only 11% of AA members and 13% of NA members are between the ages of 21 and 30, and only 2% younger than 21. While a common maxim within 12-step MHOs is to “look for the similarities and not the differences,” such similarities may be obscured, as youth tend to have differing addiction histories and life-contexts (Handelsman et al., 2005; Stewart and Brown, 1995), which may erect further barriers to identification and engagement.

In theory, a sense of cohesiveness or “universality” is deemed integral to successful group therapy operations (Yalom, 1995; Yalom and Leszcz, 2005). Cohesiveness has been found, for example, to be positively related to self-disclosure, which in turn is positively related to clinical improvement (Bertrand et al., 2013; Tschuschke and Dies, 1994); these elements are also likely to be important among non-professional groups like AA. Greater self-disclosure during 12-step meetings, for example, has been shown to be related to greater abstinence over and above the effects from 12-step attendance (Kelly et al., 2012; Kelly and Urbanoski, 2012). From an empirical standpoint, the degree to which an older age composition, specifically, may diminish a sense of cohesion and verbal participation and self-disclosure among young adults is unclear. One professional group therapy study of individuals with an alcohol use disorder comparing young adults treated in young-adult specific therapy group and young adults treated in a mixed adult therapy group found no differences in terms of premature treatment discharge, patient withdrawal or dropout from treatment; however the study did not examine alcohol outcomes (Monras et al., 2006). A more directly relevant study with adolescents (14 - 19 yrs) attending 12-step MHOs following inpatient treatment, however, found that a more similar age composition of attended AA/NA meetings at 3- and 6-months after treatment was related to better outcomes (Kelly et al., 2005). This study suggested also that while having similar-aged peers at meetings (i.e., mostly teen or all teen meetings) may be helpful early on, attending all or mostly teen meetings over time may yield diminishing returns (Kelly et al., 2005). Research in this area, in general, however, is

lacking and no studies have investigated these relationships among young adults. If the age composition of attended 12-step meetings is found to moderate the recovery-related benefits that young people derive from 12-step participation, this would support the creation of clearer clinical practice guidelines to link young adults more explicitly to groups also attended by similar-aged recovering peers.

To this end, the purpose of this study was to examine the relationships among age composition of attended 12-step meetings, young adult 12-step MHO participation, and alcohol and drug use outcomes following residential treatment. Based on prior work (Kelly et al., 2005), we hypothesized that the presence of similar-aged peers at meetings would be associated with better outcomes in the year following treatment, and that age composition would confer a unique recovery benefit above and beyond that attributable to attendance alone. Also, as noted earlier, the study by Kelly et al. (2005) suggested differential effects of age composition over time with an indication that having too similar aged composition (e.g., mostly or all teens at meetings), while beneficial early post-treatment, may actually yield diminishing returns with time. Consequently, we also explored the nature of these relationships over time to investigate this interaction more formally using rigorous longitudinal modeling. Specifically, we wondered whether the presence of similar-aged peers at AA/NA meetings would be more helpful early rather than later post-treatment.

2. METHOD

2.1. Participants

The study was conducted in accordance with ethical standards regarding human subjects and was approved by the independent Institutional Review Board at Schulmann Associates. Study participants were young adults ($N = 302$; 18-24 years) entering a private residential SUD treatment program in the Midwestern United States. A total of 607 young adults were admitted during the recruitment period (October 2006 to March 2008). To ensure sufficient representation of all ages within the target range (18-24 years), a stratified sampling procedure was used to select potential participants. All patients aged 21-24 years and every second patient aged 18-20 were asked to participate in the study. Of those approached ($n = 384$), 64 declined. Reasons given for non-participation included not wanting to participate in the follow-ups (44%), not interested (31%), wanting to focus on treatment (14%), and legal issues (2%). Seventeen participants withdrew between enrollment and the baseline assessment. The final sample of 302 represents 78.9% of those approached (see Kelly et al., 2012 for more details). Average age was 20.4 years old ($SD = 1.6$). Participants were predominantly male (73.8%) and all were single. Most were Caucasian (94.7%); 1.7% identified as American Indian, 1.3% identified as African American, and 1.0% as Asian (1.4% reported "other" or missing). At admission, 23.8% were employed full- or part-time, and 31.8% were students. Almost half had completed high school (43.4%) and 39.7% had attended college. The most commonly reported "drug of choice" was alcohol (28.1%) and marijuana (28.1%), followed by heroin or other opiates (22.2%), cocaine or crack (12.3%), and amphetamines (6.0%). Small proportions reported benzodiazepines (2.0%), hallucinogens (1.0%), or ecstasy (1.0%) as their drug of choice. (A small number of participants ($n = 5$) reported more than one drug of choice, such that these proportions do not sum to 100%.)

2.2. Procedures

Research staff conducted assessments at intake and at 3, 6, and 12 months post-discharge. Interviews were completed in person or by telephone, and self-administered surveys were completed online or returned by mail. Participants were reimbursed \$30 for the baseline and

3-month assessments, and \$40 for the 6- and 12-month assessments. Follow-up rates were 82% ($n = 248$) at 3 months, 72% ($n = 219$) at 6 months, and 71% ($n = 214$) at 12 months.

2.3. Treatment

The sample was from a large private treatment facility based on an eclectic and multidisciplinary residential approach for SUD, founded on the abstinence-based, 12-step, framework of AA (McElrath, 1997). Services were comprehensive and multi-faceted, employing evidence-based interventions based in twelve step facilitation, motivational, cognitive-behavioral, and family therapy approaches. Programming included clinical assessment, individual and group therapy, and specialty groups, such as relapse prevention, anger management, eating issues, dual disorders, gender issues, and trauma. Integrated mental health care was available on-site, including assessment, therapy, and medication management. Average length of stay was 25.6 days ($SD = 5.7$, ranging from 4 to 35 days). The majority (83.8%) was discharged with staff approval.

2.4. Measures

2.4.1. Demographics—Demographic characteristics, including age, gender, ethnicity, education, and marital status, and drug of choice were extracted from patients' records.

2.4.2. Recovery Motivation—A newly constructed Commitment to Sobriety scale (CSS) was administered at treatment intake consisting of 5-items measured on a 6-point Likert scale from 1 "strongly disagree" to 6 "strongly agree" and summed (range 0–30): "Staying sober is the most important thing in my life;" "I am totally committed to staying off of alcohol/drugs;" "I will do whatever it takes to recover from my addiction;" "I never want to return to alcohol/drug use again;" "I have had enough alcohol and drugs" (Cronbach's $\alpha = .89$; Kelly and Greene, in press).

2.4.3. Percent Days Attending a Meeting—Data were collected regarding frequency of attendance at different 12-step fellowship (AA, NA, Cocaine Anonymous, and "Other" MHOs) in the previous three months at each assessment point using the Multidimensional Mutual-help Meeting Activity Scale (Kelly et al., 2011). This variable was computed by dividing the number of meetings a participant reported attending during a particular follow-up period by the number of days in that follow-up period and multiplying by one hundred to obtain a percentage. Similarly, weekly meeting attendance was computed by dividing number of meetings attended during a follow-up period by number of weeks in the follow-up period.

2.4.4. Age composition of attended 12-step meetings—An item from the Multidimensional Mutual-help Meeting Activity Scale (Kelly et al., 2011) was used to assess the age composition at attended meetings. At each assessment participants were asked: "For the meetings you attended most often in the past 3 months, what percentage of those present were about your age?" Response options were coded ordinally as: "None," "Some," "About half," "Most," or "All."

2.4.5. Percent Days Abstinent—(PDA) was assessed using the Form-90 (Miller and Del Boca, 1994), which has demonstrated good test-retest reliability and construct validity among adults and adolescents (Slesnick and Tonigan, 2004; Tonigan et al., 1997). PDA was calculated by dividing the total number of days abstinent in each assessment period by the total number of days in each assessment period and multiplied by one hundred. To verify self-reported abstinence, a 7 panel saliva drug screening test (Cone et al., 2002) was administered at each follow-up on a sub-sample of subjects that lived within 50 miles of the

facility and could attend follow-up interviews in-person (15%). Abstinence was biochemically confirmed in 97% of subjects self-reporting abstinence.

2.5. Data Analytic Plan

All data were examined for normality. Examination of the data revealed significant skew for PDA at all follow-up points. A negative log transformation ($-\ln*[1.01-PDA]$) was utilized to reduce skew. Concurrent and lagged hierarchical linear models (HLMs) were computed to test the relation between age composition and PDA, concurrently, and in the subsequent follow-up period. HLM was selected as the analysis approach due to its ability to manage interdependence with repeated measures nested within individuals while managing missing data. Age composition was included in the HLMs as an ordinal variable ranging from zero (none) to four (all) with each level describing the degree of age homogeneity at the participant's most frequently attended 12-step group. Although the temporal resolution was not deemed ideal for evaluating clear causal connections between 12-step participation and subsequent PDA (i.e., days or weeks are more optimal than 3-month time windows), lagged models were run nevertheless to help establish temporal precedence and enhance causal inference within the confines of the study (e.g., 3-month 12-step attendance was examined in relation to subsequent 6-month PDA, and 6-month 12-step attendance in relation to 12-month PDA; Kazdin and Nock, 2003).

First, analyses were run without attendance in the models to determine if age composition of MHOs by itself was related to substance use outcome and whether this relationship with PDA differed across time. Models were then estimated with 12-step attendance included to determine if age composition conferred a unique recovery benefit over and above that of attendance. Higher order interaction effects were also examined in each model (i.e., concurrent and lagged) to determine whether the effect of attendance on PDA was moderated by the age composition at attended meetings (i.e., attendance x age composition) and whether this interaction differed over time (i.e., produced a 3-way interaction: attendance x age composition x time). In all analyses, relevant confounds were controlled. Covariates were determined by computing simple linear regression analyses with the baseline values of variables found to be related to either attrition and/or PDA over time. All variables that demonstrated significance in the simple regression models were then examined in a simultaneous multiple regression model. Covariates were retained for use in the main analyses if they remained significant in the multiple regression model. This method produced four additional covariates: educational status, 12-step membership at baseline, prior hospitalization for alcohol or drug problems, and commitment to sobriety (CSS). The baseline level of the outcome variable (PDA) also was controlled in all analyses. HLM analyses were generated using SAS Version 9.2. (SAS Institute, 2002-2008).

3. RESULTS

3.1. 12-Step Attendance and Age Composition

Only about a third of the sample attended at least one 12-step meeting in the three months prior to treatment (32.1%, $n=97$), with attendance less than once per week, on average ($M=0.66$, $SD=1.53$). However, attendance increased substantially after treatment, with 85.1% attending at least one meeting by the 3-month follow-up, with an average of four meetings per week, ($M=3.77$, $SD=3.05$). Rate of attendance diminished somewhat at the 6-month follow-up to 79.4% ($n=173$), decreasing to approximately three meetings per week, on average ($M=2.90$, ($SD=2.67$). Attendance rates decreased slightly to 73.8% ($n=158$) by the 12-month follow-up, with attendance at less than three meetings per week, on average ($M=2.08$, $SD=2.25$; see Table 1).

3.2 Specific MHOs attended

At baseline, nearly a third of the subjects had attended AA meetings (31.8%, $n = 96$), 16.6% NA meetings ($n = 59$), and over two-thirds (67.9%, $n = 205$) did not attend meetings. Across the follow-up points, AA remained the most frequently attended 12-step fellowship, with 83.9% ($n = 203$) of participants attending AA at 3-month, 74.3% ($n = 162$) attending at 6-month, and 70.1% ($n = 150$) attending AA at 12-month. In contrast only 46.3% ($n = 112$) attended NA meetings at 3-month, 29.8% ($n = 65$) at 6-month, and 22.0% ($n = 15$) at 12-month (see Table 1).

Across the three follow-up time points, approximately one-third of participants reported that “some” of the members at the most frequently attended meeting were similar in age. Specifically, 38.3% ($n = 101$) of participants at 3-month follow-up, 38.3% ($n = 98$) of participants at 6-month follow-up, and 37.1% ($n = 91$) of participants at 12-month follow-up reported that “some” of the group members were similar in age to them. Similarly, between one-third and one-half of participants reported that “none” of the group members were similar in age to them across all three follow-up points (3-month: 39.8%, $n = 105$; 6-month: 41.4%, $n = 106$; 12-month: 45.3%, $n = 111$; see Table 1).

3.2. Effects of Age Composition and 12-Step Meeting Attendance on Concurrent Abstinence

Results of the concurrent HLM analyses which did not include attendance in the model found a significant age composition by time interaction, indicating that the relation between age composition and PDA varied over time ($b = -0.14$, $p = 0.005$; see Table 2). Specifically, there was a linear increasing relationship between greater age similarity and greater PDA at 3 months post-treatment but this association diminished over time.

When attendance was added to the model, results revealed a significant three-way interaction between 12-step attendance, age composition, and time ($b = -0.536$, $p = 0.002$; see Table 2). Figure 1 depicts the results of the three-way interaction. To best present the results of this interaction effect, a median split was utilized to categorize patients into “Low Attendance” and “High Attendance.” The median split for the 3-, 6-, and 12-month follow-ups were 25.0 meetings, 29.5 meetings, and 48.0 meetings, respectively, in the three months prior to the follow-up assessment. At the 3-month follow-up, 122 young adults were classified as low attenders and 120 were classified as high attenders based on the median split. At the 6-month assessment there was an equal number of low attenders as high attenders, with 108 young adults in each group. Finally, at the 12-month follow-up, 108 young adults were classified as low attenders, while 106 young adults were classified as high attenders. Age composition was categorized into “None,” “Some but Less Than Half,” and “Half or More.” The graphs show that the age composition of groups had an effect on PDA for low attenders, especially early on post-treatment (i.e., 3-months and 6-months) but that there was a diminishing effect of age composition emerging at 6-months with these patients having the worst outcomes by 12-months.

3.3. Effects of Age Composition of 12-Step Meetings on Future Abstinence

HLM results of the lagged analysis without attendance included in the model found a significant main effect of age composition ($b = 0.305$, $p = 0.003$; see Table 2), indicating that a more similar age composition at each time point was significantly related to greater PDA at each subsequent time point (i.e., age composition at 3-month follow-up was significantly related to PDA at 6-month follow-up, etc.). Unlike the concurrent model, there was no significant interaction between age composition and time.

When attendance was added to the model, results showed a main effect for attendance ($b = 1.318$, $p = 0.017$) and a main effect for age composition ($b = 0.390$, $p = 0.043$; see Table 4), but no interaction. These results demonstrated that both more frequent meeting attendance and a greater age similarity at meetings at each time point were independently related to a greater PDA at the subsequent time point.

3. DISCUSSION

The study examined whether the age composition of 12-step meetings moderated the effect of 12-step attendance on abstinence and whether these effects differed over time in the year following residential SUD treatment among young adults. Results revealed that, when examined concurrently, the age composition of attended meetings significantly moderated the effect of attendance on abstinence. This effect was not uniform, however, as it was shown to vary significantly over time. In the lagged models, the effect of age composition was not found to moderate the effect of attendance on future abstinence. Rather, both age composition and attendance were independently related to future abstinence in an additive way and these effects did not vary significantly over time. Unraveling these findings, this study suggests that, in general, the age composition of community 12-step meetings may be an important factor to consider when attempting to engage young people with community 12-step MHOs. More specifically, linking young people to 12-step meetings with a similar age composition early following treatment may be helpful, especially for those individuals who are perhaps less committed to recovery and/or AA/NA participation, but our finding that a high degree of age similarity in the longer-term may confer diminishing returns and be much less helpful suggests encouragement to get involved in other meetings with a broader age range.

Our hypothesis that a more similar age composition at attended meetings would be significantly related to better outcomes was supported, but with an important nuance: we found that attendance interacted with age composition on PDA such that for low attenders, a more similar age composition was associated with better outcome, while this was not the case for high attenders, and among low attenders this benefit diminished over time. Overall, these findings suggest that age composition of 12-step groups is an important variable, and that it may confer additional recovery benefits over and above that of attendance at 12-step meetings. Moreover, the finding that a more similar age composition was associated with more abstinence early post treatment discharge, but declining abstinence over time, implies that similar age composition may not always be helpful to young adults' recovery. Important dynamic nuances in these relationships may exist. As illustrated in Figure 1, a more similar age composition appears to help young adults early on in increasing abstinence, especially among young adults who are low 12-step attendees and who are perhaps less committed to AA/NA and/or recovery. Over time, however, these related beneficial effects attenuate and, in fact, highly similar age composition was related to the lowest levels of abstinence by 12 months post-discharge. It may be that similar-aged 12-step members help young adults to get "a foot in the door", but once they are across the threshold and have become more engaged in 12-step MHOs, this age similarity becomes less important. In fact, attending meetings where there at least some *older* members, many of whom may possess longer-term sobriety, more recovery experience, and greater wisdom that come with longer life experience, may actually be more helpful for some young adults.

Findings here are consistent with those of an adolescent study by Kelly et al. (2005) that found a relationship between age composition and outcome, and which suggested a similar diminishing return on abstinence over time following discharge. It is unclear, however, why interaction effects were detected here in concurrent, but not lagged, models. As noted previously, it may be that the temporal resolution of the follow-up assessments is not ideal

for detecting these effects, since the “half-life” of meeting participation is likely to be more ephemeral (e.g., attending five meetings this week is likely to relate to an enhanced likelihood of continued abstinence next week, but perhaps not next month or three months from now). Future research should examine these relations among these variables using finer temporal resolutions to help determine the robustness of these findings.

Of note, we found that the vast majority of this sample of young adults attended the AA fellowship, rather than the NA fellowship, despite only a minority having alcohol as their primary substance at treatment entry (in keeping with national estimates of primary substances; Substance Abuse and Mental Health Services Administration, 2012). This discrepancy between type of substance for which a young adult typically presents for treatment and the substance-specific focus of the fellowship attended could be due to the fact that young adults attend groups where they expect to find other young adults present, since AA is more likely to have designated “Young Persons” meetings than NA (www.aa.org; www.na.org). Alternatively, it may be that because AA is much more prevalent than NA, young adults attend out of convenience, despite a potential primary substance mismatch. Given these distinct drug-specific 12-step fellowships began, presumably, in an attempt to foster greater identification and group cohesion this potential mismatch is one that should be investigated further.

The findings from this study have implications for treatment recommendations for young adults early in recovery. Specifically, while attending 12-step meetings in general was associated with better outcomes, locating and linking young adults to groups containing at least some similar aged peers may enhance further the likelihood of initial engagement and lead, ultimately, to even better outcomes. As stated previously, although not formally assessed here, findings are consistent with group theories of the therapeutic value of similarity on important variables (e.g., Yalom and Leszcz, 2005). The more one identifies with others in a group and perceives shared experiences and values, the stronger the potential for group engagement, cohesion, and therapeutic benefit.

4.1. Limitations

Findings from this study should be considered carefully in light of several limitations. First, the variable of interest – age composition – was based on perception rather than objective measurement and only the age composition of the most frequently attended 12-step meetings was assessed. Findings are based on a mostly White, male, residential treatment sample. It is unclear how findings may generalize to outpatient samples and other ethnic and mostly female groups. Similarly, the sample was treated in a private, 12-step oriented, residential treatment program and generalizations to non-12-step treatment samples should be made cautiously. Last, although we controlled for predictors of attrition in our HLM analyses, attrition may nevertheless have affected the power needed to detect significant three-way interactions in some analyses. Despite these limitations, this study has several strengths, including a large clinical sample of young adults, an age-stratified sampling procedure, and the clinical and addiction recovery significance of the findings.

4.2. General Conclusions

Overall, results indicate that among young adults, a more similar age composition at attended 12-step fellowship meetings may enhance the degree of benefit derived from 12-step participation, especially early post discharge from treatment. This benefit may be particularly salient for low attendees who are perhaps less committed to 12-step participation and/or recovery more generally. Consequently, treatment and SUD continuing care services, criminal justice, child and family services, and other referral agencies might enhance the likelihood of successful remission and recovery among young adults by locating

and initially linking such individuals to age appropriate community groups. Our findings suggest also, however, that once engaged in 12-step MHOs, it might be beneficial to encourage a gradual integration into the broader mixed-age range of 12-step fellowship meetings, wherein it is plausible that older members may provide the greater depth and length of recovery and life experience needed to carry young adults forward into long-term recovery.

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Figure 1.

Interaction of the dynamic effect of age composition of 12-step meetings on PDA across time: a more similar age composition of 12-step groups was related to increased PDA among low attenders early post-treatment, but the effect reversed by 12 month follow-up.

Table 1

Twelve-step fellowship attendance and age composition.

	Baseline (<i>n</i> = 302)	3-month (<i>n</i> = 248)	6-month (<i>n</i> = 225)	12-month (<i>n</i> = 216)
Any 12-step attendance (<i>N</i> , %)	97 (32.1)	206 (85.1)	173 (79.4)	158 (73.8)
# of meetings attended per week (<i>M</i> , <i>SD</i>)	0.66 (1.53)	3.77 (3.05)	2.90 (2.67)	2.08 (2.25)
12-step fellowship (<i>N</i> , %)				
Alcoholics Anonymous	96 (31.8)	203 (83.9)	162 (74.31)	150 (70.09)
Narcotics Anonymous	50 (16.6)	112 (46.3)	65 (29.82)	47 (21.96)
Other	11 (3.64)	18 (7.44)	13 (5.96)	4 (1.87)
None	205 (67.9)	36 (14.9)	45 (20.6)	56 (26.2)
Similarity of Age Composition				
None	--	105 (39.8)	106 (41.4)	111 (45.3)
Some	--	101 (38.3)	98 (38.3)	91 (37.1)
About half	--	29 (11.0)	24 (9.4)	25 (10.2)
Most	--	27 (10.2)	26 (10.2)	18 (7.4)
All	--	2 (0.8)	2 (0.8)	0 (0.0)

†Some participants reported attending more than one type of 12-step fellowship and therefore, percentages may not sum to 100

Table 2

Covariate-adjusted hierarchical linear models (HLMs) * of concurrent and lagged effects of age composition on PDA a) without attendance, and b) with attendance.

	Without Attendance				With Attendance			
	B	SE	F	p	B	SE	F	p
<i>Concurrent</i>								
Time	0.483	0.078	38.48	0.000	0.505	0.104	23.61	0.000
Age Composition	0.400	0.088	20.89	0.000	0.047	0.122	0.15	0.699
Attendance	-	-	-	-	2.045	0.439	21.74	0.000
Time * Age Composition	-0.140	0.050	7.98	0.005	0.001	0.072	0.00	0.991
Time * Attendance	-	-	-	-	0.153	0.281	0.30	0.587
Attendance * Age Composition	-	-	-	-	0.873	0.278	9.84	0.002
Time * Attendance * Age Composition	-	-	-	-	-0.536	0.174	9.47	0.002
<i>Lagged</i>								
Time	-0.207	0.196	1.12	0.293	0.055	0.406	0.02	0.892
Age Composition	0.305	0.100	9.40	0.003	0.390	0.190	4.19	0.043
Attendance	-	-	-	-	1.318	0.545	5.85	0.017
Time * Age Composition	-0.187	0.130	2.09	0.151	-0.416	0.271	2.35	0.127
Time * Attendance	-	-	-	-	-0.268	0.827	0.10	0.747
Attendance * Age Composition	-	-	-	-	-0.411	0.333	1.53	0.219
Time * Attendance * Age Composition	-	-	-	-	0.377	0.504	0.56	0.456

* Models controlling for predictors of attrition (education), predictors of PDA (12-step member, substance use hospitalization and commitment to sobriety) and baseline levels of the outcome variable (PDA)