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Alcoholics Anonymous Attendance, Decreases in Impulsivity, and Drinking and Psychosocial Outcomes over 16 Years: Moderated-Mediation from a Developmental Perspective

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Abstract

Aims—Examine whether decreases in impulsivity account for links between AA attendance and better drinking and psychosocial outcomes, and whether these mediational “effects” are conditional on age.

Design—A naturalistic study in which individuals were assessed at baseline, and 1, 8, and 16 years later.

Setting—Participants initiated help-seeking through the alcohol intervention system (detoxification programs, information and referral centers).

Participants—Individuals with alcohol use disorders and no prior history of substance abuse treatment at baseline [$N=628$; 47% women; mean age = 34.7 years ($SD=9.4$)].

Measurements—Self-reports of impulsivity and drinking pattern at baseline and Year 1, duration of AA (number of weeks) in Year 1, and drinking (alcohol use problems, self-efficacy to resist drinking) and psychosocial outcomes (emotional discharge coping, social support) at baseline and follow-ups.

Findings—Controlling for changes in drinking pattern, decreases in impulsivity were associated with fewer alcohol use problems, better coping, and greater social support and self-efficacy at Year 1, and better coping and greater social support at Year 8. Decreases in impulsivity statistically mediated associations between longer AA duration and improvements on all Year 1 outcomes, and indirect effects were moderated by participant age (significant only for individuals 25 years of age or younger).

Conclusions—Decreased impulsivity appears to mediate reductions in alcohol-related problems over 8 years in people attending Alcoholics Anonymous.

Attendance in Alcoholics Anonymous (AA) is associated with reduced drinking and improved psychosocial functioning in individuals with alcohol use disorders (AUDs)^{1–5}. These findings have sparked a recent surge in efforts to identify mechanisms underlying these associations⁶. Reduced impulsivity is a plausible mechanism of behavioral change associated with the benefits of AA. Impulsivity has been defined in terms of poor self-control, deficits in self-regulation of cognition and motivation, and a tendency to respond to

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stimuli with little forethought⁷. Traits related to impulsivity are core risk factors for AUDs^{8,9}, and strong predictors of psychosocial outcomes¹⁰.

Using a sample of individuals with AUDs, we previously found longer AA duration over 1 and 16 years to be associated with decreases in impulsivity over these timeframes for both men and women¹¹. Here, we expand on these findings to examine whether reduced impulsivity can help explain links between longer AA duration and better drinking and psychosocial outcomes. Examination of this issue provides a novel extension of recent efforts to identify mechanisms of change associated with AA's salutary effects^{12–15}, is compatible with definitions of substance abuse recovery that emphasize global health and citizenship¹⁶, and is consistent with AA's vision of recovery as a broad transformation of character¹⁷.

Reduced impulsivity as a potential mechanism of change associated with AA attendance

A relationship between impulsivity and AUDs is well-established¹⁸. Impulsivity is higher among individuals with AUDs than those without AUDs^{19–21} and has consistently been found to predate the onset of alcohol-related problems^{22–26}. In addition, higher impulsivity is associated with lower alcohol-related self-efficacy⁴, greater use of avoidant coping²⁷ (particularly emotional discharge coping)^{28,29}, and poorer quality of social relationships^{30,31}.

Although traditionally conceptualized as static variables, personality traits such as impulsivity are viewed in contemporary models as dispositional tendencies that can change over the life-course³². For example, engagement in social roles that require increased self-control predicts decreases in traits related to impulsivity³¹. In this regard, mutual-help groups target deficits in self-regulation of behavior^{33,34}, and encourage greater organization and structure in individuals' daily lives³⁵. Thus, there are theoretical grounds to expect AA attendance to press for decreases in impulsivity. Further, given associations between impulsivity and drinking and psychosocial outcomes, decreases in impulsivity may account for part of the association between AA attendance and these outcomes.

Developmental considerations

Examination of the link between AA duration and decreases in impulsivity must consider normative patterns of change in impulsivity over the life-course. Specifically, impulsivity declines most prominently in young adulthood (ages 18–30) and only gradually thereafter^{36–39}. Accordingly, we hypothesized that the association between longer AA duration and decreases in impulsivity may be conditional on age, such that this association would hold only for individuals in young adulthood. If so, indirect effects of decreases in impulsivity in associations between AA duration and outcomes may also be conditional on age. Hence, we employed moderated mediation models to test if indirect effects of decreases in impulsivity in accounting for associations between AA duration and outcomes were significant for younger but not older individuals.

Methods

Participants

Participants were individuals with AUDs who had an initial contact with the alcohol intervention system through either a detoxification program or an information and referral center. Informed consent was obtained on-site by program staff, and 628 individuals (47% women) were recruited based on no previous history of substance abuse treatment, and an AUD (i.e., one or more dependence symptoms, substance use problems, drinking to intoxication in the past month, and/or the perception that alcohol use was a significant

problem)⁴⁰. On average, participants at baseline consumed 13.1 ounces of ethanol ($SD=11.2$) on a typical drinking day, were intoxicated 13.7 days ($SD=10.8$) in the past month, and reported 3.9 ($SD=6.8$) symptoms of physical dependence and 3.8 drinking-related problems ($SD=6.1$). Participants were primarily Caucasian (81.4%), unmarried (79.0%), and unemployed (59.6%), were 34.7 years old, on average, ($SD=9.4$) with 13.1 years of education ($SD=2.3$) and an annual income of \$12,225.

At baseline, participants completed an inventory assessing their drinking and psychosocial functioning. Participants were contacted by phone after 1, 8, and 16 years and asked to complete an inventory that was largely identical to the baseline protocol. Out of the baseline sample, 82% ($n=515$) and 74% ($n=466$) participated in the 1- and 8-year follow-ups, respectively, and 80% of the baseline sample who were not known to have died ($n=405$ out of 507) participated in the 16-year follow-up.

Measures

AA attendance—At Year 1, participants were asked whether they had attended AA for drinking-related problems since baseline, and the duration (number of weeks) of attendance ($M=15.4$, $SD=19.2$). Prior research has documented the reliability and validity of self-reported AA attendance^{41–43}.

Impulsivity—A 10-item impulsivity scale from the Differential Personality Inventory⁴⁴ was included at baseline ($\alpha=.74$) and Year 1 ($\alpha=.73$). Items were rated on a 4-point scale (0=*strongly disagree*, 3=*strongly agree*), which reflected respondents' level of agreement with statements regarding lack of planning (e.g., I like to do things on the spur of the moment) and impulsive behavior (e.g., I act more impulsively than most people). Higher scores indicate greater self-reported impulsivity. There was a significant and moderate decline in impulsivity from baseline ($M=14.84$, $SD=4.36$) to Year 1 ($M=13.14$, $SD=4.18$), as estimated by a repeated measures ANOVA ($d=-.38$; $p<.01$). The correlation between impulsivity at baseline and Year 1 was .53 ($p<.001$).

Drinking patterns—Participants reported their drinking pattern in the past month on a six-point scale (1=*did not drink at all*, 6=*occasional drinking binges*) at baseline ($M=4.11$, $SD=1.39$) and Year 1 ($M=2.20$, $SD=1.43$).

Drinking outcomes—A composite of *alcohol use problems* was constructed at each time point by computing the average of standardized scores on two variables: (1) *Drinking-related problems* were assessed with 9 items from the Health and Daily Living Form⁴⁵ ($\alpha=.80-.91$). Items were rated on a 5-point scale (0=*never*, 4=*often*) and summed to index the degree to which participants experienced problems due to drinking in the past 6 months (e.g., work, health, financial); (2) *Alcohol dependence severity* was measured with 11 items from the Alcohol Dependence Scale⁴⁶ ($\alpha=.88-.94$). Items were rated on a 5-point scale (0=*never*, 4=*often*) and measured physical symptoms as a result of drinking in the past 6 months (e.g., shakes when sobering up). Drinking-related problems and alcohol dependence severity were highly intercorrelated at all time points ($rs=.65-.85$, $ps<.001$). *Self-efficacy to resist drinking* was measured at each time point with 14 items adapted from the Situational Confidence Questionnaire⁴⁷. Items were rated on a 6-point scale (0=*not at all confident*, 5=*very confident*) and covered situations involving negative and positive emotions, and interpersonal conflict ($\alpha=.95-.98$).

Psychosocial outcomes—At baseline, Year 1, and Year 8, *emotional discharge coping* was measured with a 5-item scale adapted from the Coping Responses Inventory⁴⁸. Items were rated on a 4-point scale (1=*no*, 4=*fairly often*) and reflected use of an avoidant coping

style to reduce tension (e.g., by smoking, taking tranquilizers, taking it out on others). These items were not included in the Year 16 assessment battery. Although the internal consistency of this scale was lower than optimal ($\alpha=.54-.56$), we included it because of its conceptual importance and because more reliance on avoidance coping has been associated with worse alcohol-related outcomes⁴⁰.

At each time point, a *social support* composite was constructed by computing the average of standardized scores on quality of support from relatives and friends using items adapted from the Life Stressors and Social Resources Inventory⁴⁷. Support from relatives ($\alpha=.76-.83$) was the sum of 3 items (e.g., can confide in your relatives), and support from friends ($\alpha=.85-.93$) was the sum of 6 items (e.g., can confide in your friends), rated on the same 5-point scale (0=*no*, 4=*often*). These variables were moderately intercorrelated at all time points ($rs=.37-.43$, $ps<.001$).

Analytic plan

To test whether decreases in impulsivity (baseline to Year 1) explained associations between AA duration (Year 1) and the outcomes at each follow-up, we conducted multiple regression analyses. Mediation would be supported if (1) AA duration significantly predicted decreases in impulsivity, (2) decreases in impulsivity significantly predicted the outcome, controlling for AA duration, (3) the AA duration-outcome link was reduced when both AA duration and decreases in impulsivity were entered^{50,51}, and (4) the Sobel test of indirect effects was significant⁵². For all regressions, age, the outcome at baseline, and decreases in drinking pattern (baseline to Year 1) were controlled. Decreases in impulsivity and drinking pattern were computed by subtracting scores at Year 1 from baseline (i.e., higher scores indicated a greater decline in these variables).

Next, we conducted moderated mediation analyses to test whether indirect effects for decreases in impulsivity, with respect to AA-outcome associations, differed across age. We first tested whether the zero-centered interaction term between AA duration (Year 1) and baseline age was significant in the prediction of decreases in impulsivity (baseline to Year 1), controlling for the main effects of the interaction term and decreases in drinking pattern. Next, using Model 2 of Preacher et al.⁵³ we ran conditional indirect effects models in *SPSS 18.0* in which moderation by age is hypothesized to occur between the independent variable (i.e., AA duration) and mediator (i.e., decreases in impulsivity). Moderated mediation would be established if the indirect effect of AA duration on the outcomes, via decreases in impulsivity, differed in strength across younger (-1 SD) and older ($+1$ SD) individuals.

Results

Intercorrelations between study variables at baseline and AA duration (Year 1)

Baseline impulsivity and alcohol use problems were modestly associated with longer AA duration (Table 1). Higher impulsivity was associated with more alcohol use problems, less self-efficacy, greater reliance on emotional discharge coping, and less social support at baseline. Older age was associated with less impulsivity, fewer alcohol use problems, and less reliance on emotional discharge coping at baseline; thus, age was controlled in all analyses.

Reduced impulsivity as a mediator of associations between AA duration (Year 1) and outcomes

Table 2 provides results from multiple regression models testing associations between decreases in impulsivity and drinking and psychosocial outcomes at each follow-up. Significant associations for the Year 1 and Year 8 outcomes were followed up in the

meditational models and are discussed below. Decreases in impulsivity were unrelated to Year 16 outcomes; thus, mediational models focused only on significant associations between decreases in impulsivity and outcomes at Years 1 and 8.

Figures 1 and 2 provide results of models testing whether decreases in impulsivity mediated associations between AA duration and outcomes during Year 1. In each model, decrease in drinking pattern was included as an independent mediator of associations between AA duration and outcomes and these results are presented in each figure as a basis of comparison with the indirect paths for decreases in impulsivity.

For Year 1 drinking outcomes (Figure 1), longer AA duration was related to fewer alcohol use problems and greater self-efficacy. Regarding indirect effects, longer AA duration was associated with greater decreases in impulsivity, which were associated with fewer alcohol use problems and greater self-efficacy. For alcohol use problems (Panel A), when AA duration, decreases in impulsivity, and decreases in drinking pattern were entered together, the effect of decreases in impulsivity remained significant. The association between AA duration and alcohol use problems was reduced, but remained significant. Per Sobel tests, indirect effects were significant for decreases in impulsivity ($z=-2.78, p<.01$) and drinking pattern ($z=-3.69, p<.001$). For self-efficacy (Panel B), when AA duration, decreases in impulsivity, and decreases in drinking pattern were entered together to predict this outcome, decreases in impulsivity remained significant, and the AA duration-self-efficacy link was reduced to nonsignificance. Per Sobel tests, indirect effects were significant for decreases in impulsivity ($z=2.57, p<.01$) and drinking pattern ($z=4.40, p<.001$).

For Year 1 psychosocial outcomes (Figure 2), longer AA duration was associated with less reliance on emotional discharge coping and greater social support. Regarding indirect effects, longer AA duration was associated with greater decreases in impulsivity, which were associated with less reliance on emotional discharge coping and greater social support. When AA duration, decreases in impulsivity, and decreases in drinking pattern were entered together to predict emotional discharge coping (Panel A), decreases in impulsivity remained a significant predictor. The association between AA duration and emotional discharge coping was reduced to nonsignificance. Per Sobel tests, indirect effects were significant for decreases in impulsivity ($z=-2.66, p<.01$) and drinking pattern ($z=-3.17, p<.001$). When AA duration, decreases in impulsivity, and decreases in drinking pattern were entered together to predict social support (Panel B), decreases in impulsivity remained a significant predictor. The AA duration-social support link was reduced, but remained significant. Per Sobel tests, there was a significant indirect effect for decreases in impulsivity ($z=2.44, p<.05$) but not decreases in drinking pattern ($z=1.60, p=.11$).

For Year 8 psychosocial outcomes, longer AA duration (Year 1) was not significantly associated with either emotional discharge coping ($\beta=-.05, p=.28$) or social support ($\beta=.05, p=.32$). However, for both outcomes we tested the indirect effects of decreases in impulsivity, given (a) the 8-year outcomes would provide a strong test of temporal precedence, and (b) assertions by some scholars that a significant link between a predictor and outcome is not required to test mediation when the predictor is distal to the outcome, such as in long-term longitudinal studies^{54,55}. When AA duration, decreases in impulsivity, and decreases in drinking pattern were entered together as predictors, the decrease in impulsivity was a significant predictor of emotional discharge coping ($\beta=-.15, p<.01$) and social support ($\beta=.13, p<.01$). Per Sobel tests, indirect effects for decreases in impulsivity were significant for both outcomes ($ps<.05$). Nonetheless, given that direct effects of AA duration on 8-year outcomes were nonsignificant, analyses probing moderated mediation were limited to 1-year outcomes.

Moderated mediation of AA duration (Year 1) and 1-Year outcomes via decreases in impulsivity by age

Having established patterns of association consistent with mediation, we examined if indirect effects of decreases in impulsivity in associations between AA duration and Year 1 outcomes were conditional on baseline age. The interaction between AA duration and age approached significance in the prediction of decreases in impulsivity ($\beta = -.08$, $p = .07$). Post-hoc tests of conditional moderators⁵⁶, based on 1 SD below and above mean age at baseline (≤ 25.4 years, ≥ 44.2 years, respectively) indicated that longer AA duration was associated with a significant decrease in impulsivity over this timeframe for younger ($\beta = .22$, $p < .001$), but not older individuals ($\beta = .06$, $p = .34$; Figure 3).

To test for moderated mediation in associations between AA duration and Year 1 outcomes (via decreases in impulsivity), age-conditioned indirect effects were tested separately for each outcome, with models constructed in the same manner as depicted in Figures 2 and 3. Estimates of the conditional indirect effects (unstandardized), standard errors⁵⁷ and z -statistics, and p -values at level of age (± 1 SD) are presented in Table 3. For each outcome, the conditional indirect effect of decreases in impulsivity was significant for younger, but not older individuals.

Discussion

The present findings suggest that decreases in impulsivity may help explain the salutary effects of AA attendance. Specifically, we found decreases in impulsivity to be associated with fewer alcohol use problems, greater self-efficacy, better coping, and greater social support at Year 1, and better coping and greater social support at Year 8. In addition, decreases in impulsivity accounted for a significant part of the association between longer AA duration and improvements on all Year 1 outcomes. Notably, these associations, which are consistent with a mediational process, were independent of changes in drinking pattern. Thus, the association between longer AA duration and reduced impulsivity was incremental to AA's association with reduced drinking.

Our prior^{11,58} and current findings of a link between AA duration and decreases in impulsivity suggest that attendance in this mutual-help group may facilitate improvements on a range of outcomes beyond alcohol use, and is consistent with definitions of recovery that emphasize improvements in global health¹⁶. Moreover, our findings suggest that efforts to identify mechanisms of change associated with AA may benefit from consideration of changes in personality traits that have been consistently linked to substance abuse (disinhibition, negative emotionality)^{24,26}. In this regard, extant research has only examined links between AA and reductions on indicators of negative emotionality (i.e., anger, depression)^{12,14}. Although preliminary, the current findings are novel and complement efforts to investigate whether formal and informal help for AUDs is linked to improvements on domains of emotional and behavioral functioning.

The notion of reduced impulsivity as a function of receipt of help for drinking draws support from theories of social processes that underlie substance use-focused mutual-help groups and other evidence-based AUD treatments^{35,59}. Specifically, such interventions encourage greater structure, organization, goal-direction, and responsibility in participants' lives, all of which are contradictory to the immediate self-gratification characteristic of disinhibition. Accordingly, engagement in a group that promotes such an orientation may press for reductions in impulsive inclinations. This perspective aligns with evidence that entering into social roles that promote increased self-control predicts reductions in impulsivity³¹, and sociogenomic models of personality, which posit that traits can be modified by systemic changes to one's environment⁶⁰.

Beyond these theoretical implications, a potential link between AA attendance and declines in impulsivity is particularly relevant, given that impulsivity is a robust predictor of a host of consequential outcomes associated with substance abuse. In our prior analyses, we observed decreases in impulsivity over 1 and 16 years to be associated with decreases in legal problems over these time periods¹¹, and decreases in impulsivity helped to explain the association between longer AA duration and fewer incidents of driving while intoxicated⁵⁸. The current analyses extend this work by demonstrating cross-sectional and prospective links between reduced impulsivity and better coping and greater social support.

Regarding the moderated mediation analyses, the findings help bridge the alcohol treatment and personality development literatures, and encourage future studies that test mechanisms of behavioral change to consider their developmental context. Our results highlight young adulthood as a period in which AUD interventions may yield the largest improvements in behavioral functioning⁶¹. Nevertheless, given that the normative course of impulsivity during mid-life is also marked by decreases in impulsivity, albeit at slower pace relative to young adulthood³⁹, it is conceivable that continued engagement in AA may facilitate reductions in impulsivity throughout the lifespan.

Limitations and future directions

Limitations of this study must be acknowledged. Most notably, given the contemporaneous measurement of impulsivity and Year 1 outcomes, temporal precedence cannot be determined⁶². It is conceivable that changes in the “outcomes”, particularly social support¹⁵ and self-efficacy⁶³, mediate the link between AA duration and reduced impulsivity, or that the pathways among these constructs operate in a reciprocal fashion over the course of recovery. However, acknowledgment of this limitation should be balanced by consideration of the following. First, for Year 1 alcohol use problems, the indirect effect of decreases in impulsivity remained significant after controlling for decreases in drinking pattern. Second, significant indirect effects for decreases in impulsivity in relation to coping and social support at Year 8 lend credence to the possibility that reductions in impulsivity may predict subsequent improvements in these outcomes. Third, the notion of reduced impulsivity as a function of longer AA duration is consistent with theoretical models from the alcohol treatment and personality literatures^{35,60}. Finally, this preliminary test of impulsivity as a potential benefit of AA attendance encourages future research on a novel and unexplored mechanism of change.

Other issues to acknowledge include the fact that the present study used an observational design (i.e., not a randomized controlled trial). Although the findings may reflect the “real-world” impact of AA attendance, the role of selection factors and other unmeasured pre-treatment factors could not be ascertained. From a measurement standpoint, our assessment of impulsivity was limited to a brief scale from an established self-report inventory. It may behoove future studies to employ indices of impulsivity from contemporary measures^{64,65}, consider the multi-faceted nature of impulsivity⁶⁶, and gather data from multiple informants to help detect “blind spots” for which individuals lack insight into their behavioral tendencies⁶⁷. In addition, given the positive correlation between baseline impulsivity and AA duration (Year 1), regression to the mean may have contributed in part to the association between AA duration and reduced impulsivity.

Finally, measurement of AA “involvement” was limited to amount of attendance rather than content or progress in this mutual-help group. Without measurement of such variables or a comparison group, we cannot infer that there is something unique about AA that relates to decreases in impulsivity. However, there are a number of potential active ingredients of mutual-help groups that appear to capture part of the unique fellowship of AA and could be examined in future research (e.g., cohesion/support, goal direction, structure)³⁵.

The current findings contribute to a burgeoning literature on potential emotional and behavioral mechanisms of change associated with AA. Although several mechanisms have already been identified⁶, a link between AA duration and reduced impulsivity is also plausible, given the well-established relationship between impulsivity and substance abuse¹⁸, theoretical models of active ingredients in substance use-focused mutual-help groups³⁵, and developmental models of personality^{32,60}. Thus, future efforts to examine whether decreases in impulsivity can account for AA's salutary effects are warranted.

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Figure 1. Decreases in impulsivity (baseline to Year 1) as mediators of associations between AA duration (Year 1) and drinking outcomes at Year 1 (controlling for age and the outcome measure at baseline, and decrease in drinking pattern from baseline to Year 1). Values shown are standardized (beta) coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 2.

Decreases in impulsivity (baseline to Year 1) as mediators of the association between AA duration (Year 1) and psychosocial outcomes at Year 1 (controlling for age and the outcome measure at baseline, and decrease in drinking pattern from baseline to Year 1). Values shown are standardized (beta) coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.

Age as a moderator of the association between AA duration (Year 1) and decreases in impulsivity from baseline to Year 1 (controlling for the main effects of the interaction term, and decrease in drinking pattern from baseline to Year 1).

Table 1

Intercorrelations between study variables at baseline and AA duration (Year 1).

	1	2	3	4	5	6	7	8
1. AA duration	--							
2. Impulsivity	.12**	--						
3. Drinking pattern	.02	.19***	--					
4. Alcohol use problems	.09*	.41***	.38***	--				
5. Self-efficacy to resist drinking	.01	-.32***	-.33***	-.39***	--			
6. Emotional discharge coping	.07	.41***	.26***	.50***	-.36***	--		
7. Social support	-.03	-.23***	-.12**	-.32***	.25***	-.20***	--	
8. Age	.03	-.24***	-.01	-.15***	.03	-.20***	-.03	--

Note. Ns = 503–628.

 $p < .001$

**

 $p < .01$

*

 $p < .05$

Decreases in impulsivity (baseline to Year 1) predicting drinking and psychosocial outcomes at Years 1, 8, and 16 (controlling for age and the outcome variable at baseline, and decreases in drinking pattern from baseline to Year 1).

Table 2

Predictors	Drinking outcomes					
	Alcohol use problems			Self-efficacy to resist drinking		
	Year 1	Year 8	Year 16	Year 1	Year 8	Year 16
Age (baseline)	-.06	-.03	-.10	.10*	.07	.17**
Outcome (baseline)	.47***	.22***	.18**	.41***	.12*	.17**
Decreases (baseline to Year 1):						
Drinking pattern	-.31***	-.13*	-.12*	.38***	.20***	.21***
Impulsivity	-.19***	-.07	.00	.14***	.07	-.05

Predictors	Psychosocial outcomes					
	Emotional discharge coping			Social support		
	Year 1	Year 8	Year 16	Year 1	Year 8	Year 16
Age (baseline)	-.03	-.15**	--	.05	.00	-.04
Outcome (baseline)	.51***	.31***	--	.58***	.44***	.47***
Decreases (baseline to Year 1):						
Drinking pattern	-.19***	-.11*	--	.08*	.07	.08
Impulsivity	-.18***	-.15***	--	.16***	.13**	.03

Note. *Ns* Year 1 = 485–505. *Ns* Year 8 = 389–407. *Ns* Year 16 = 344–347. Data for emotional discharge coping were not available at Year 16. Each drinking and psychosocial outcome was tested in a separate model. All predictors were entered together into each model. Higher scores indicate a greater decrease in drinking pattern and impulsivity from baseline to Year 1.

p < .001

**
p < .01

*
p < .05

Table 3

Moderated mediation of AA duration (Year 1) predicting drinking and psychosocial outcomes at Year 1 via decreases in impulsivity (baseline to Year 1) across levels of age at baseline.

Outcome	Level of age	Conditional Indirect Effect	SE	z	p
Alcohol use problems					
	Low	.0020	.0007	2.78	.005
	High	.0005	.0006	0.80	.422
Self-efficacy to resist drinking					
	Low	.0342	.0146	2.34	.019
	High	.0094	.0105	0.89	.373
Emotional discharge coping					
	Low	-.0056	.0023	-2.46	.014
	High	-.0016	.0018	-0.89	.371
Social support					
	Low	-.0012	.0005	-2.36	.018
	High	-.0002	.0004	-0.54	.587

Note. Low and high age = $\pm$ 1 SD, respectively. Conditional indirect effects are unstandardized coefficients. The main effect of baseline age, the outcome measure at baseline, and decreases in drinking pattern (baseline to Year 1) were controlled in all models.