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Heterogeneity in Growth and Desistance of Alcohol Use for Men in Their 20s: Prediction from Early Risk Factors and Association with Treatment

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Abstract

Background—The course of men’s alcohol use from ages 18–19 to 28–29 years was examined using growth mixture modeling (GMM) to determine alcohol trajectories for 3 conceptualizations of alcohol use: volume of use, heavy-episodic drinking (HED), and drinking-related problems. Trajectory classes were validated against the young men’s alcohol treatment history, and childhood/adolescent predictors of trajectory membership were examined.

Method—Participants were 205 men from the Oregon Youth Study, an ongoing longitudinal study of predominantly White men recruited from higher crime neighborhoods who were assessed annually during their 20s. The multivariate association between 3 prospectively assessed risk factors — parental alcohol use, child antisocial behavior, and age at first drunken experience — and the latent classes extracted from the GMM was examined for each alcohol indicator.

Results—A 3-class-solution model best fit the data for each alcohol indicator. The classes for both HED and problematic drinking for the men were significantly associated with history of treatment for alcohol use. Overall, the findings indicated a relatively large class with persistently high volume of alcohol use across the 20s and a greater prevalence of desistance for HED and alcohol problems. Age at first intoxication was the best predictor of latent class membership, and men in the initially-high-then-desisting alcohol classes had a high level of early risk. Concordance of trajectory class membership across alcohol indicators was moderate overall but particularly strong for higher problem groups, as almost all men in the increasing HED trajectory were also in the highest volume and alcohol problems trajectory classes. Levels of treatment were high for the higher and desisting HED and alcohol problems classes.

Conclusions—Many of the men showed chronic alcohol use across the decade of the 20s and had problems resulting from their high usage. Whereas most of the men showed low and/or desisting HED across this period, desistance was less common for volume of use and for alcohol problems.

Keywords

alcohol problems; early adult; heavy drinking; heterogeneity in alcohol use; trajectories

Young adulthood may be the riskiest time for harmful consumption of alcohol, which peaks at the start of the 20s (Johnston et al., 1996). Use levels may asymptote or decrease in the early to mid 20s (Cohen et al., 2007). Major gaps remain in our understanding of developmental patterns of alcohol use in early adulthood. First, studies of patterns of alcohol

use have focused on adolescence (e.g., Hanson et al., 2006; Warner et al., 2007) or young adulthood (Schulenberg et al., 1996) and generally have not examined changes in alcohol use during the decade after late adolescence. Studies that have examined heterogeneity in the course of alcohol use during the post-adolescent years extended assessments only through the early 20s (Tucker et al., 2003) or had large gaps (e.g., 7 years) between assessment waves that precluded adequate modeling of alcohol use (White et al., 2000). Heterogeneity among individuals in changes in alcohol behavior may be captured by alcohol trajectory groups (e.g., a desistance group) that can be extracted only with frequent assessments of alcohol use throughout the 20s. Second, studies have focused on measures related to volume of alcohol consumed or on heavy-episodic drinking (HED; Windle et al., 2005) but have paid less attention to examining (a) heterogeneity in drinking-related problems (Warner et al., 2007), (b) heterogeneity in trajectories derived from multiple indicators of alcohol use, and (c) the prediction of alcohol use patterns from alcohol risk factors.

The present study used growth mixture modeling (GMM; Muthén, 2004) to extract latent classes of alcohol trajectories using 10 annual assessments of men from their late teens through their late 20s with separate models for 3 alcohol indicators: (a) volume of alcohol consumed, (b) HED, and (c) alcohol problems. Three predictors of trajectories were examined derived from a developmental model of alcohol use that describes general risk factors associated with antisocial behavior and also alcohol-specific risk history (Kerr et al., in press): (a) parental alcohol use, (b) childhood antisocial behavior, and (c) age at first drunken experience. These factors, particularly the first 2, have been frequently examined as predictors of adolescent alcohol use but less is known regarding their associations to patterns of use in the 20s, and it is important to establish if these early risk factors predict changes in alcohol behavior during this period. The alcohol trajectory models were validated by examining whether the men assigned to different classes also differed in history of alcohol-related treatment, and concordance across classes for each of the 3 alcohol indicators was examined. The study thus adds to the limited literature on trajectories of alcohol use during the 20s and makes an additional contribution by testing hypotheses for predominantly White men of lower socioeconomic status (SES) in the Oregon Youth Study (OYS) who had been raised in disadvantaged neighborhoods in a medium-sized town in the Pacific Northwest.

The U.S. 12-month prevalence rates of DSM-IV alcohol abuse and dependence (in 2001-02) in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Grant et al. 2003) were 8.69% and 4.98%, respectively, for men aged 30-44 years, and 10.10% and 5.13% for White men in this same age group (Grant et al., 2006). Costanzo et al. (2007) found that White men showed the highest rates of HED through age 40 years. Further, as antisocial behavior is predictive of alcohol use in early adulthood (Dishion et al., 1999; Dubow et al., 2008), identifying patterns of persistence and desistance in alcohol use for White men in their 20s who had higher levels of antisocial behavior in childhood than the population average is a health priority.

Findings for Heterogeneity in Course of Alcohol Use in the 20s

In a review of studies on the course of alcohol involvement during adolescence and early adulthood (approximately to age 25 years), Jackson and Sher (2005) noted consistent findings of 4 types of alcohol users: a nonuser/low-use class, a chronic or high-use class, a desisting class, and a later onset/increasing class. Warner et al. (2007) examined problem drinking symptoms from ages 12 to 31 years and found 3 classes similar to the first 3 of these 4 classes.

Alternative Indices of Alcohol Use

Jackson and Sher (2005) used GMM to examine patterns of alcohol use (defined by HED, alcohol consequences, and volume of alcohol use) from ages 18 through 29 years in students at a 4-year college, 50% of whom had a family history of alcoholism. They found relatively similar classes across different indices that were interpreted as consistent with findings in the literature of the 4 prototypic classes of alcohol use. However, cross-classification of group membership across the different alternative indices of alcohol use indicated low to moderate concordance.

Muthén and Muthén (2000a) used GMM to examine trajectories of HED from ages 18–30 years in the National Longitudinal Survey of Youth (NLSY). The 4-class solution indicated 2 high-declining classes, low-increasing, and low-HED classes, with 73% of the sample falling into the low-HED class.

Sher et al. (2011) concluded that 4 prototypic classes of alcohol involvement emerged regardless of study characteristics (e.g., age at baseline) and emphasized that researchers should not reify such models. Whereas the latter recommendation is valid, there are numerous studies of heterogeneity in growth in other psychopathological behaviors, including self-reported delinquency (Wiesner and Capaldi, 2003) and depressive symptoms (Stoolmiller et al., 2005), where the 4 classes they described were not found. It is thus not a given that the same trajectory classes would emerge from alcohol use data collected throughout the 20s or from different types of participants (such as our largely working-class sample of men). In addition, many of the past studies have had relatively few measurement occasions compared to the 10 assessments used in the present research, and non-linearity of growth may have resulted in misspecified GMM models in prior work that would not be the case in the current study.

Early Risk and Persistence and Desistance in Alcohol Use in the 20s

The relatively few studies that have examined the associations of earlier risk factors with alcohol trajectory classes in adulthood have obtained inconsistent findings. Muthén and Muthén (2000b) reported that heavy drinking from ages 21–27 years was associated with family history of problematic alcohol use. Bennett et al. (1999) found that desistance was associated with *higher* levels of problems — which included greater parental permissiveness — in their youngest cohort. Warner et al. (2007) found no significant difference between a desister class and a chronic/escalating problem class for feeling drunk at first use, age at first use, or family history of alcoholism. Jackson and Sher (2005) found that the desisting class of drinkers over the 20s was intermediate in conduct disorder between the chronic-drinking class and the low-use class.

Prediction from General versus Specific Developmental Risk

Family adversity and externalizing behaviors in youth have been found to predict their alcohol use at middle age (Dubow et al., 2008; Englund et al., 2008; Maggs et al., 2008). Zucker (2008) recommended the examination of this general risk pathway predictor of externalizing behaviors and of risk factors specific to alcohol use, such as parental use (Zucker et al., 1995). In addition to possible genetic associations (Kendler et al., 2008), children's alcohol use might be directly influenced by parental use via modeling, and indirectly, for example, due to easier access to alcohol. Parental use is predictive of offspring's use (Englund et al., 2008; Merline et al., 2008) and Jackson and Sher (2005) and Warner et al. (2007) both found that family history of alcoholism was related to persistent problems with alcohol in the 20s.

Age at first alcohol intoxication is a risk factor of increasing interest because early use of alcohol may affect brain development in adolescents in a manner that increases the probability of later problematic use (Brown and Tapert, 2004). However, prospective studies that have tested the association of age at first drunken experience with adult problematic alcohol use after controlling for antisocial behavior are scarce (McGue et al., 2001; Sartor et al., 2006).

In sum, it was hypothesized that a 3- or 4-latent class GMM solution was likely to fit the data for each of the 3 alcohol indicators well. Given the at-risk nature of the present sample, we expected to find some men (a) with overall high levels of use/problems across the 11-year period from ages 18–19 to 29–30 years, (b) who had high levels of use/problems at ages 19–20 years but who declined over time, and (c) who displayed low levels of drinking and no alcohol problems. If a 4-class solution fit the data, we expected to find some men with moderate use or with increasing use over time. It was hypothesized that a childhood history of parental alcohol use and antisocial behavior and an early age of first intoxication would predict persistent levels of use. Lower risk was hypothesized to be predictive of either consistently low use or desistance in alcohol use.

Method

Participants

Fourth-grade classes of boys in schools in higher-delinquency neighborhoods in a medium-sized metropolitan area in the Pacific Northwest were invited to participate in the OYS in the early 1980s, and 74% were recruited (Capaldi and Patterson, 1987; $N = 206$). Data from 1 participant who died early in the study was not included in the current analyses. Assessments were conducted annually from ages 10 to 32 years (excluding ages 26–27 years), and participation rates ranged from 93% to 99%. Participants were primarily White (90%) and from lower- and working-class families (75%). The OYS has had continuous human subjects' approval, and new consent forms were completed at each assessment.

Procedures

Assessments were multimethod and multiagent and included interviews, questionnaires, telephone interviews regarding recent behaviors (a total of 6, 3 days apart), home observations (a total of 3 45-minute observations at Grades 4 and 6), family problem-solving discussions, school data (teacher questionnaires and records data), and court records data.

Measures

The alcohol indicators used in the GMM were assessed yearly from ages 18–19 to 28–29 years, except at ages 26–27 years. The construct development strategy used for the predictor variables has been described elsewhere (e.g., Dishion et al., 1999), and the reliability and validity of the assessments was established. To form each scale or indicator, the mean of the items was taken, and to form a measure of a construct, indicators that met established convergence criteria were standardized before being combined to ensure equal weight was given to each indicator contributing to composite scores. For the parental behavior measures, the mean of the mother and father scores was taken when data were available from both parents. Antisocial behavior was assessed when the boy was in Grades 4, 5, and 6, and parental alcohol use was assessed at Grades 4 and 6. In each case, the indicators were standardized and then the mean of the time points was calculated. Youth/men's reports of having been drunk were assessed yearly.

Men's childhood antisocial behavior—Scales were created from parent (a. Child Behavior Checklist – Achenbach and Edelbrock, 1983; b. Overt Covert Antisocial Behavior

Questionnaire –Oregon Social Learning Center [OSLC], 1984a; c. Telephone Interview; d. Peers Questionnaire), teacher (a. Teacher Report Form – Achenbach, 1991; b. Teacher Peer Social Skills Questionnaire – Dishion and Capaldi, 1985; Walker and McConnell, 1988), youth (a. Telephone Interview; b. annual interview), interviewer (Interviewer Rating Scales), and home observations (a. coded Youth Negative Behavior - Stubbs et al., 1998; b. observer ratings). Cronbach's alpha for these indicators was .70 and .88 at Grades 4 and 6, respectively. For Grade 5 (limited assessment), $r = .50$ ($p < .001$) between the parent and teacher indicators.

Parental alcohol use—Frequency of use (Substance Use Questionnaire -- Grades 4 and 6; OSLC, 1984b) and alcohol problems (Michigan Alcohol Screening Test -- Grade 4 only; Selzer, 1971) were associated for mothers and fathers: $r = .17$ ($p < .05$) and $r = .31$ ($p < .001$), respectively. An indicator was computed for mothers and fathers ($r = .39$, $p < .001$), and the mean was taken for parental use.

Men's age at first drunken experience—From childhood, the men were asked annually whether they had even been drunk and the age was recorded for the first positive response. In 8 cases, the first positive response followed 1 or more waves of missing data. For 2 cases with numerous missing waves, the age of onset of problems caused by drinking was substituted from the Composite International Diagnostic Interview (CIDI; World Health Organization, 1997) obtained at ages 25–26 years. Six participants never reported having been drunk and were assigned their age at the most recent wave available (age 32 years), but this age was not included in the analyses, because the focus was on the 20s.

Men's alcohol treatment—From ages 18–19 to ages 31–32 years, the men were asked approximately annually if they had received any treatment for alcohol use in the past year. This was used to create a dichotomous variable for alcohol treatment (any versus none).

Men's alcohol use—Men who had drunk any alcohol in the past year reported frequency and typical amount used for beer, wine, and hard liquor; (a) the number of times used in the past year (capped at 365) and (b) the amount of alcohol consumed at each time (i.e., less than 1 unit, 1 unit, 2 units, 3 units, 4 to 5 units, 6 units or more). The units of volume were equilibrated across alcohol types. Men reporting no alcohol use in the past year were assigned scores of 0 for the alcohol use variables.

Volume of alcohol use was calculated from frequency of use multiplied by the usual amount consumed for beer, wine, and hard liquor, separately, and then these values were summed to create the total yearly volume scores (log transformed prior to use in the analysis). HED was defined as consumption of 5 or more drinks at a time in the past 2 weeks, coded 0 = never, 1 = once, 2 = twice, and 3 = more than twice.

Alcohol problem scores were calculated as the mean of 8 items. One item (“When drinking, how high/drunken do you usually get?”) was scaled 0 = no/not at all, 1 = a little bit, 2 = quite, and 3 = very. In order to retain the full information from this item, yet still combine the raw score with the dichotomous items (namely being unable to stop drinking, being drunk, being drunk in a public place, passing out from drinking, throwing up from drinking, losing or breaking things when drinking, and usually getting drunk when drinking), the dichotomous items were scaled (no = 0, yes = 3).

Design

We used GMM (Mplus Version 6.1; Muthén and Muthén, 1998–2010) to determine alcohol trajectory classes and GMM with covariates to predict these classes from early risk factors

for each of the 3 indicators of alcohol use. Although missing data were minimal, full information maximum likelihood estimation with robust standard errors was utilized to take advantage of all the data (Little and Rubin, 2002).

For each alcohol indicator, an unconditional longitudinal growth model and an unconditional GMM were estimated. Linear, linear spline, and quadratic models were tested. Convergence, comparative fit, parsimony, class size, and the precision of the individual class assignments were considered in model selection (Feldman et al., 2009). Replication of a consistent maximum likelihood value over multiple randomly selected starting values and generation of appropriate standard errors was required for model convergence. The Bayesian Information Criteria (BIC) along with other fit criteria were used (Nylund et al., 2007) to select the number of classes. Model selection criteria included (a) minimizing the BIC, (b) minimum class sizes of 5% of the sample, (c) the Akaike Information Criterion (AIC; Akaike, 1987), and (d) class probabilities. The precision of the individual class assignments was assessed by the average posterior probabilities for class membership and the entropy (Muthén, 2004). A GMM with covariates was used to predict membership in trajectory classes, and χ^2 tests were used to associate the groups formed from the classes with history of treatment for alcohol misuse.

Results

Overall, 3- and 4-class models fit the data well; but in the latter, some class sizes were low, and for alcohol problems, a satisfactory 4-class solution could not be obtained (2 of the classes were highly similar). As solution comparisons across the 3 indicators were facilitated by a consistent number of classes, a 3-class solution was chosen for each indicator. The 4-class solutions for volume and heavy drinking are available from the authors upon request.

Alcohol Volume Model

In the 3-trajectory class solution (Figure 1; Loglikelihood -2019.40, BIC 4219.78, AIC 4106.80, average class probabilities .874/.933/.942), Class 1 showed Low to Moderate use (16.5%); Class 2 showed High Desisting use (16.5% of sample); Class 3 showed High Chronic use (67%). The means for volume of use at age 29 years, weighted by estimated class probabilities for Classes 1, 2 and 3, were 1.177 ($SD = 1.182$), 0.265 ($SD = 0.473$), and 2.435 ($SD = 0.544$), respectively —which yielded large effect sizes for Class 2 versus 1 (Cohen's $d = -1.01$), Class 3 versus 1 ($d = 1.37$), and Class 3 versus 2 ($d = 4.26$).

In Panel I of Table 1 are the mean levels of the predictors for the 3 classes and Panel II shows the odds ratios for the multivariate regression results. Contrary to hypothesis, parent alcohol use did not significantly distinguish the early adult trajectory classes, although the mean levels indicated that the High Chronic class showed the highest levels of parent alcohol use and the Low to Moderate class the lowest levels. For antisocial behavior, again contrary to hypothesis, the High Chronic class was lower than the other 2 classes. Regarding age at first drunkenness, there were no significant differences among the 3 classes, although the means were in the expected direction.

Heavy-Episodic Drinking Model

In the 3 trajectory group solution for HED (Figure 2; Loglikelihood -2537.09, BIC 5217.91, AIC 5128.19, average class probabilities .933/.970/.981), Class 1 showed Moderate Desisting HED (18% of sample); Class 2 showed Moderate Increasing drinking (13%); Class 3 showed Low Desisting drinking (69%). The Moderate Desisting class reported drinking 5 or more drinks in a row on about 1.3 occasions on average in the past 2 weeks at ages 18–19 years but only on about 0.3 occasions by ages 28–29 years. The Moderate

Increasing class was drinking at a similar level initially but had increased to about 2.6 occasions on average by ages 28–29 years. Note that because the most occasions that could be reported was “3 or more times,” a number of men could have been drinking heavily on more than 3 occasions on average. For HED, the means at age 29 years, weighted by estimated class probabilities for Classes 1, 2 and 3, were 0.289 ($SD = 0.454$), 2.609 ($SD = 0.488$), and 0.044 ($SD = 0.205$), respectively —which yielded large effect sizes for Class 2 versus 1 (Cohen's $d = 4.92$), Class 3 versus 2 ($d = -6.86$), and a medium effect size for Class 3 versus 1 ($d = -0.70$).

Mean levels of the predictors for the 3-class HED model are shown in Panel I of Table 2, and the odds ratios for the multivariate regression results are shown in Panel II of Table 2. Mean levels indicated that the Moderate Increasing class showed the highest level of parent alcohol use, and the Moderate Desisting class showed the highest level of antisocial behavior. However, contrary to hypothesis, neither parental alcohol use nor antisocial behavior significantly distinguished the 3 HED classes. Age at first drunkenness was significantly higher for the Low Desisting class than for either of the other 2 classes.

Alcohol Problems Model

In the linear model 3-class solution for alcohol problems (Figure 3; Loglikelihood -1355.36, BIC 2881.06, AIC = 2774.72, average class probabilities .937/.925/.986), Class 1 was Low Desisting (23%), Class 2 was High Desisting (14%), and Class 3 was Moderate Chronic (63%). The means for alcohol problems at age 29 years, weighted by estimated class probabilities for Classes 1, 2 and 3, were 0.102 ($SD = 0.214$), 0.382 ($SD = 0.476$), and 0.924 ($SD = 0.509$), respectively — which yielded a medium-effect size for Class 2 versus 1 (Cohen's $d = 0.76$) and large-effect sizes for Class 3 versus 1 ($d = 2.11$) and Class 3 versus 2 ($d = 1.10$).

Mean levels of the predictors for the 3 groups are shown in Panel I of Table 3. The mean levels were in the direction of high childhood and adolescent risk for the High Desisting class. In the multivariate prediction model, parent alcohol use, childhood antisocial behavior, and age at first drunken experience (Panel II of Table 3) all significantly distinguished the alcohol problems classes (at the $p < .10$ level at least). The High Desisting class showed higher levels and the Moderate Chronic class marginally higher levels of parental alcohol use than did the Low Desisting class. The High Desisting class showed marginally higher levels of antisocial behavior than did the Moderate Chronic class. A higher age at first drunken experience was associated with membership in the Low Desisting class compared with either of the other 2 classes.

Alcohol Treatment by Latent Class Membership

χ^2 tests were conducted on the association of class memberships with alcohol treatment from ages 18–19 to 31–32 years. For alcohol volume, the proportions reporting any treatment by class were 24% for the Low Moderate class, 41% for the High Desisting class, and 26% for the High Chronic class, which was not a significant difference ($\chi^2 [2] = 4.02$, $p = .134$). For HED, the treatment proportions were 21% for the Low Desisting class, 41% for the Moderate Desisting class, and 42% for the Moderate Increasing class, which was significant at the .05 level ($\chi^2 [2] = 8.94$, $p = .011$). Finally, for alcohol problems, the treatment proportions were 15% for the Low Desisting class, 45% for the High Desisting class, and 28% for the Moderate Chronic class, which was a significant difference at the .05 level ($\chi^2 [2] = 8.44$, $p = .015$). These findings indicate higher levels of treatment among the HED and alcohol problems desisting groups.

Class Membership Comparisons for the 3 Alcohol Use Indicators

Class membership for each of the 3 alcohol use indicators was compared 2 at a time (Table 4) because small cell sizes for a number of cells precluded a 3-way comparison. χ^2 tests indicated that each of the 2-way comparisons was significant: volume by HED ($\chi^2(4) = 17.72, p < .01$), volume by problems ($\chi^2(4) = 90.04, p < .001$), and problems by HED ($\chi^2(4) = 33.37, p < .001$). Men in the 2 higher HED classes were very unlikely to be in the Low to Moderate volume class and most likely to be in the High Chronic volume class. Many men in the Low Desisting HED class were in the High Chronic volume class (61%), indicating a pattern of drinking frequently and/or at a substantial volume while rarely or never engaging in HED.

For alcohol problems versus volume, 86% of the men in the Moderate Chronic problems class also were in the High Chronic volume class. Those with High Desisting problems were most likely to be in the High Desisting volume class.

Finally, for alcohol problems versus HED, men in the Low Desisting problems class were all in the Low Desisting HED class. Men in the High Desisting problems class were very likely to be in 1 of the 2 desisting HED classes. Finally, men in the Moderate Chronic problems class accounted for all but 1 of the men in the Moderate Increasing HED classes. Overall, comparisons across trajectory class membership for the 3 indicators of — alcohol use indicated moderate to high concordance.

Discussion

This study assessed heterogeneity in the trajectories of 3 indicators of alcohol use alcohol volume, HED, and alcohol-induced problems — from ages 18–19 through 28–29 years and the associations of latent classes to both early (i.e., childhood and adolescent) risk factors and to treatment for alcohol use. The models yielded consistently different solutions than those reported by Sher et al. (2011) to be frequently found in GMM of alcohol data.

The relatively large number of measurement occasions (10) in the present work allowed us to examine non-linearity in growth and desistance of alcohol use. Non-linear models fit the data better than did simpler linear models for both volume of use and HED. For both of these indicators, a class was found that had increased use to around age 23 years followed by a sharp decrease. Findings showed some similarity to results of studies of alcohol involvement through the mid 20s that also found a pattern of high chronic and desisting use for alcohol volume (Jackson and Sher, 2005).

Although we had expected the GMM to yield a non- or low-use latent class for each alcohol indicator, chosen solutions instead identified a low- to moderate-chronic class of men with lowest levels of alcohol use, which may be attributable to the initial SES level of our sample. In addition, alcohol use was assessed from young adulthood through the late 20s, a developmental period when drinking rates are at their highest (Cohen et al., 2007; Johnston et al., 1996). No late-onset latent class was extracted, which would have involved essentially a post-high school or adult-onset group. The GMM for alcohol volume found that a large majority of the men maintained high-chronic use across the period.

Findings for HED also showed some consistency with previous studies. Muthén and Muthén's (2000a) NLSY study also identified moderate-desisting, moderate-increasing, and low-desisting HED classes from ages 18-30 years, although more of the men in the present study showed moderate then increasing usage rather than low then increasing usage, possibly reflecting the at-risk nature of the OYS sample. HED was the only alcohol indicator in the present study for which a substantially increasing trajectory class was found.

After classifying men into observed trajectory groups on the basis of posterior probabilities from the models, concordance among the three indicators was examined. We found relatively high concordance for the most problematic group of men for each indicator. However, models also indicated that men may have substantial problems with regard to alcohol volume and problems without engaging in regular HED. Alcohol treatment was not significantly associated with the volume classes but was associated with both the HED and alcohol problem classes. In particular, the desisting classes had a greater rate of treatment. Thus, treatment may be very effective for men in their 20s showing HED and problems resulting from alcohol use. Overall, the prevalence of alcohol treatment was relatively high. This may be due to both the at – risk nature of the sample and that treatment was assessed 13 times over a 14-year period, rather, for example, than being asked once retrospectively.

Prediction from childhood and adolescent risk factors did not fully support the hypotheses. Fewer significant associations were found than expected, and lower prior risk was not associated with high desisting or moderate desisting patterns compared with persisting patterns. The alcohol-specific risk factor of parental use frequency and problems was only associated with latent class membership for alcohol problems. However, means were in the expected direction for the high versus lower groups for volume and HED class. It is possible that if family history of alcoholism had been used, stronger associations might have been found. Counter to our hypotheses, but consistent with Bennett et al. (1999), the high-then-desisting latent class for each indicator showed particularly high levels of antisocial behavior, which may be related to the higher levels of treatment received by these men. Age at first intoxication proved to be an important predictor of differential alcohol use in the 20s, especially for both the HED and alcohol problems. It is particularly noteworthy that age at first drunken experience was predictive of higher levels of problematic alcohol use through the late 20s, even after controlling for risk from parent alcohol use and childhood antisocial behavior. It may partially mediate the association of these variables with HED and alcohol problems at these ages and be a key indicator of longer term problematic alcohol use.

This study had some unusual strengths — including yearly measurement of 3 indicators of use —but also had some limitations. The size of the sample and some of the latent classes extracted were relatively small, reducing power to detect associations of risk factors with class membership. In addition, because the sample was composed of low SES and predominantly White men, generalizability of our findings to women, other ethnic groups, and men of higher SES warrants further study. Note also that the use of GMM comes with recognition that class solutions are not ‘found’ subpopulations but appropriate explanations of heterogeneity given the OYS data and sample.

Findings from this study indicated that men raised in lower SES neighborhoods are likely to have a high-chronic volume of alcohol use and moderate-chronic alcohol problems but low or desisting engagement in HED across the decade of the 20s. Desistance was more likely in men who had received treatment for alcohol use and, thus, who may have experienced relatively severe consequences of their drinking. Prediction from early risk factors was limited and suggested that influences in adulthood may be more important in predicting patterns of alcohol use in the 20s than are earlier life risks and experiences. Findings for prediction from age at first intoxication, in particular, indicated the importance of examining alcohol-specific developmental predictors in addition to general risk pathway predictors. Overall, the findings indicate the importance of examining heterogeneity of differential indicators of alcohol use in the 20s and the associations between risk factors and alcohol trajectory classes, in order to understand patterns of adult drinking behavior.

Note.

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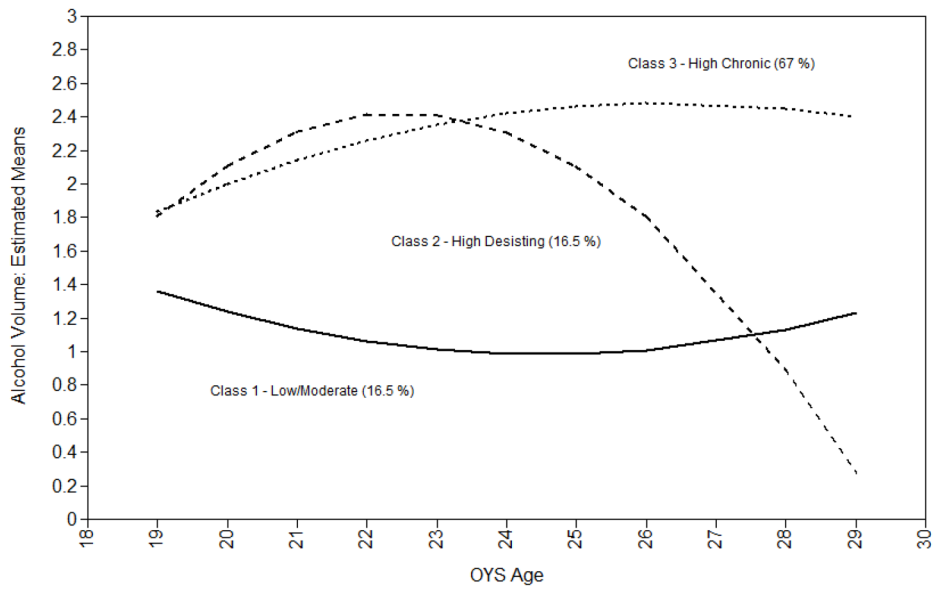


Figure 1. 3-class solution for volume of alcohol use trajectories.

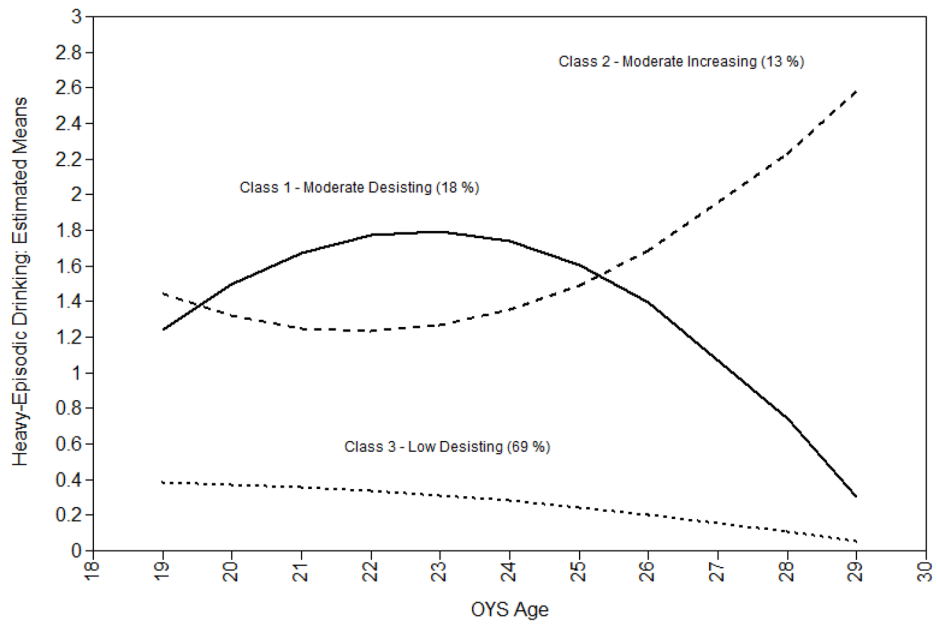


Figure 2. 3-class solution for heavy-episodic drinking trajectories.

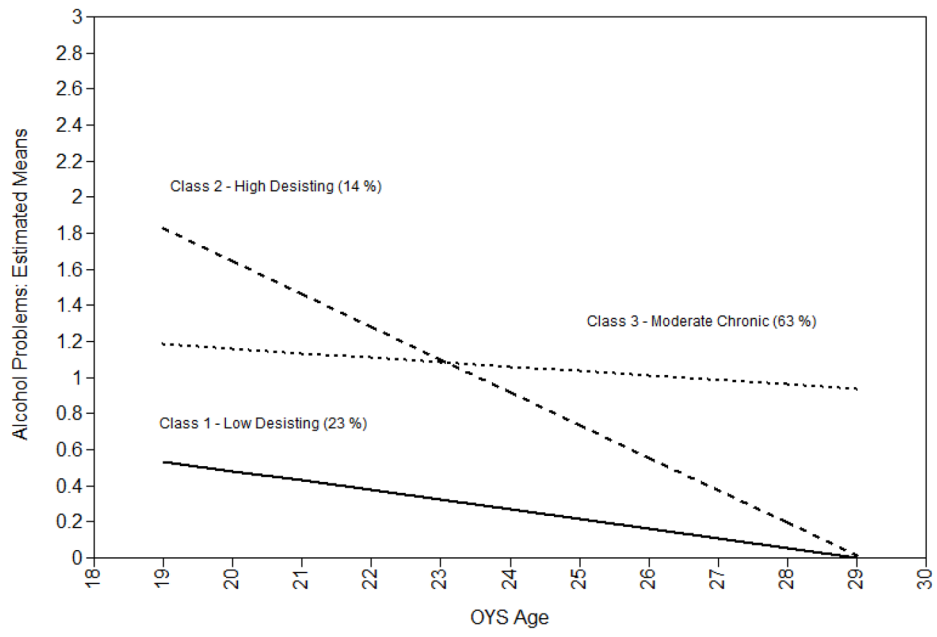


Figure 3.
3-class solution for alcohol problems trajectories.

Table 1

3-Class Volume Model

Panel I. Mean Levels of Predictors by 3-Class Volume Model						
	34		34		137	
	Low Moderate	High Desisting	High Desisting	High Chronic	Mean	(SD)
Parent Alcohol Use	-.44	(.76)	.07	(1.05)	.14	(.82)
Antisocial Behavior	.11	(1.00)	.66	(1.00)	-.18	(.74)
Age at 1 st Drunkenness (in years)	19.83	(6.41)	15.94	(3.20)	16.74	(2.83)

Panel II. 3-Class Volume Model Trajectory Odds Ratios						
	Reference Class: Low Moderate		Reference Class: High Desisting		Reference Class: High Chronic	
	High Desisting	High Chronic	Low Moderate	High Chronic	Low Moderate	High Desisting
Parent Alcohol Use	1.507	2.024	0.664	1.342	0.494	0.745
Antisocial Behavior	1.201	0.357**	0.833	0.298**	2.798**	3.360**
Age at 1 st Drunkenness	0.833	0.795	1.201	0.953	1.259	1.049

Note.

** p < 0.01.

* p < 0.05.

† p < 0.10.

Table 2

3-Class Heavy-Episodic Drinking Model

Panel I. Mean Levels of Predictors by 3-Class Heavy-Episodic Drinking Model					
	142		37		26
	Mean	(SD)	Mean	(SD)	Mean (SD)
Parent Alcohol Use	-.05	(.88)	.17	(.90)	.26 (.81)
Antisocial Behavior	-.03	(.90)	.26	(.94)	-.16 (.66)
Age at 1 st Drunkenness (in years)	17.82	(4.29)	14.98	(2.11)	16.34 (1.90)

Panel II. 3-class Heavy-Episodic Drinking Model Trajectory Odds Ratios						
	Reference Class: Moderate Desisting		Reference Class: Moderate Increase		Reference Class: Low Desisting	
	Moderate Increase	Low Desisting	Moderate Desisting	Low Desisting	Moderate Desisting	Moderate Increase
Parent Alcohol Use	1.270	0.961	0.787	0.757	1.041	1.322
Antisocial Behavior	0.668	0.983	1.498	1.473	1.017	0.679
Age at 1 st Drunkenness	1.177 [†]	1.355 ^{**}	0.850 [†]	1.153 [*]	0.738 ^{**}	0.868 [*]

** p < 0.01.
 * p < 0.05.
 † p < 0.10.

Table 3

3-Class Alcohol Problems Model

Panel I. Mean Levels of Predictors by 3-Class Alcohol Problems Model						
<i>n</i> =	48		29		128	
	Low Desisting	High Desisting	Moderate Chronic	Mean	(SD)	Mean
Parent Alcohol Use	-.46	(.85)	.51	(.86)	.11	(.81)
Antisocial Behavior	-.26	(.84)	.46	(.98)	.00	(.84)
Age at First Drunkenness (in years)	20.72	(5.60)	15.19	(2.50)	16.21	(2.21)

Panel II. 3-class Alcohol Problems Trajectory Odds Ratios						
	Reference Class:		Reference Class:		Reference Class:	
	Low Desisting	High Desisting	Low Desisting	Moderate Chronic	Low High	Desisting
Parent Alcohol Use	2.643*	1.707†	0.378*	0.647	0.586†	1.547
Antisocial Behavior	1.359	0.847	0.736	0.623†	1.181	1.605†
Age at 1st Drunkenness	0.570**	0.636**	1.754**	1.117	1.571**	0.895

Note.
 ** p < 0.01.
 * p < 0.05.
 † p < 0.10.

Table 4

Concordance across Classes by Indicator

Panel I. Volume by HED Classes				
	Low Moderate Count	High Desisting Count	High Chronic Count	Total Count
Low Desisting	31	25	86	142
Moderate Desisting	0	9	28	37
Moderate Increasing	3	0	23	26
Total	34	34	137	205
$\chi^2 (4) = 17.72, p < .01$				

Panel II. Volume by Problems Classes				
	Low Moderate Count	High Desisting Count	High Chronic Count	Total Count
Low Desisting	21	11	16	48
High Desisting	1	17	11	29
Moderate Chronic	12	6	110	128
Total	34	34	137	205
$\chi^2 (4) = 90.04, p < .001$				

Panel III. HED by Problems Classes				
	Low Desisting Count	Moderate Desisting Count	Moderate Increasing Count	Total Count
Low Desisting	48	0	0	48
High Desisting	20	8	1	29
Moderate Chronic	74	29	25	128
Total	142	37	26	205
$\chi^2 (4) = 33.37, p < .001$				