

Adolescent Alcohol Use Trajectories: Risk Factors and Adult Outcomes

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abstract

OBJECTIVES: Adolescents often display heterogenous trajectories of alcohol use. Initiation and escalation of drinking may be important predictors of later harms, including alcohol use disorder (AUD). Previous conceptualizations of these trajectories lacked adjustment for known confounders of adolescent drinking, which we aimed to address by modeling dynamic changes in drinking throughout adolescence while adjusting for covariates.

METHODS: Survey data from a longitudinal cohort of Australian adolescents ($n = 1813$) were used to model latent class alcohol use trajectories over 5 annual follow-ups (mean age = 13.9 until 17.8 years). Regression models were used to determine whether child, parent, and peer factors at baseline (mean age = 12.9 years) predicted trajectory membership and whether trajectories predicted self-reported symptoms of AUD at the final follow-up (mean age = 18.8 years).

RESULTS: We identified 4 classes: abstaining ($n = 352$); late-onset moderate drinking ($n = 503$); early-onset moderate drinking ($n = 663$); and early-onset heavy drinking ($n = 295$). Having more alcohol-specific household rules reduced risk of early-onset heavy drinking compared with late-onset moderate drinking (relative risk ratio: 0.31; 99.5% confidence interval [CI]: 0.11–0.83), whereas having more substance-using peers increased this risk (relative risk ratio: 3.43; 99.5% CI: 2.10–5.62). Early-onset heavy drinking increased odds of meeting criteria for AUD in early adulthood (odds ratio: 7.68; 99.5% CI: 2.41–24.47).

CONCLUSIONS: Our study provides evidence that parenting factors and peer influences in early adolescence should be considered to reduce risk of later alcohol-related harm. Early initiation and heavy alcohol use throughout adolescence are associated with increased risk of alcohol-related harm compared with recommended maximum levels of consumption (late-onset, moderate drinking).



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Deidentified individual participant data will be made available to researchers who provide a methodologically sound proposal for use in achieving the goals of the approved proposal. Proposals should be submitted to amy.peacock@unsw.edu.au.

WHAT'S KNOWN ON THIS SUBJECT: Adolescent drinking trajectories are often found to be heterogenous. Age at initiation and escalation of drinking may be important predictors of alcohol-related problems in early adulthood. However, no research has conceptualized these trajectories with adjustment for known confounders.

WHAT THIS STUDY ADDS: Parenting factors (alcohol-specific household rules, child monitoring) in early adolescence predicted lower risk of early-onset heavy drinking, whereas peer influences increased risk. Early-onset heavy drinking increased the risk of meeting criteria for alcohol use disorder on the basis of self-reported symptoms.

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Alcohol use is the leading global risk factor for burden of disease among people aged 10–24 years.^{1,2} Although drinking typically increases with age in adolescence,³ adolescent populations have displayed heterogeneous trajectories of initiation and progression of alcohol consumption. For instance, some adolescents escalate their drinking rapidly and with increasing quantity as they age, whereas others remain infrequent moderate drinkers.^{4–6} Transition through various stages of alcohol consumption (eg, from initiation to regular or binge drinking) may be an important predictor of later alcohol problems, such as alcohol dependence symptoms and neglecting responsibilities because of drinking.⁷ Indeed, recent research suggests that speed of progression from initiation to first intoxication and, in turn, to high-risk drinking and harm may be more important in predicting later alcohol problems than age of first initiation alone.^{8–10}

Life course–informed investigations of alcohol consumption trajectories, including their precipitants and outcomes, are important for informing public health policy aimed at reducing alcohol-related harms in young people. However, previous attempts to conceptualize the developmental course of alcohol consumption have differed greatly in the measurement of alcohol use and the ages at which consumption is assessed. For instance, previous efforts to explore trajectories of binge drinking in adolescence have obscured important information regarding variation in drinking frequency and quantity.^{5,6} The few studies that have modeled the growth of both typical frequency and quantity of use across adolescence have been limited by small sample size¹¹ and follow-up occasions that were either too sparse (>1-year follow-up period)¹² or irregular (eg, annual follow-up for 3 years and

subsequently skipping 2 years of follow-up).⁴ Because adolescence is a rapid period of development,¹³ these issues around follow-up limit inferences about patterns of adolescent alcohol consumption that elevate risk for later alcohol problems, making more targeted prevention efforts challenging to develop.

Identifying the relationship between characteristics, such as parent and peer influences, and trajectory of alcohol use may also facilitate the identification of at-risk adolescents for early intervention. Although there is evidence to suggest that parenting practices are associated with the likelihood that adolescents engage in risky drinking,¹⁴ the long-term impact is unclear because of limitations of existing longitudinal research (eg, biases in sample selection, lack of adjustment for confounders, limitations in follow-up periods and retention).^{15,16} Likewise, existing studies examining peer influences on the development of alcohol use behaviors have often lacked adjustment for covariates that influence alcohol use^{17–19} (eg, household composition²⁰ and alcohol-related parenting factors^{21–23}). Given that the effect of early adolescent behaviors on alcohol problems in adulthood are attenuated (and in some cases, eliminated) when accounting for such confounders,⁹ the role of parent, child, and peer factors in predicting trajectories of alcohol consumption requires further clarification.

In our study, we aimed to first identify trajectories of adolescent alcohol consumption comprising typical frequency and quantity of drinking and, second, to investigate their prospective predictors from a range of baseline child, parent, and peer factors. Additionally, we aimed to examine whether trajectories of adolescent alcohol consumption were differentially associated with later experiences of alcohol abuse, alcohol

dependence, and alcohol use disorder (AUD) symptoms in early adulthood.

METHODS

Participants and Procedure

In our study, we used the Australian Parental Supply of Alcohol Longitudinal Study (APSALS) cohort, which comprised 1927 parent-adolescent dyads recruited from grade 7 classes in Australian private independent (49%), Catholic (12%), and government (39%) schools via an opt-in process in 2010–2011. Recruitment methods are described in detail elsewhere.^{24,25} The APSALS cohort demographics were similar to the Australian population in terms of sex distribution, household composition, racial background, and parental education, although lower socioeconomic groups were underrepresented.^{24,25} In each annual wave of follow-up, we sent participants an online or paper hardcopy questionnaire to assess drinking behaviors and a range of constructs related to alcohol uptake and drinking patterns. To minimize misreporting, we sent questionnaires to each adolescent and parent separately.

For these analyses, we used data collected from adolescents annually over 7 years (2010–2011 to 2016–2017; mean age = 12.9 and 18.8 years, respectively) and data collected from parents in wave 1. Of the 1927 adolescents recruited into the study, 77.5% ($n = 1494$) completed the wave 7 follow-up questionnaire (see Supplemental Fig 2 for flowchart of cohort retention); participants who completed ≥ 3 waves were included in the current study ($n = 1813$). The study was approved by the University of New South Wales Sydney Research Ethics Committee and ratified by the Universities of Tasmania, Newcastle, and Queensland and Curtin University.

Measures

Alcohol Consumption

Self-reported frequency and typical quantity of alcohol consumption for the past 12 months were measured from wave 2 to wave 6 (mean age = 13.9 and 17.8 years, respectively): (1) frequency of alcohol consumption: never, less than once a month, ~1 day a month, 2–3 days a month, 1–2 days a week, 3–4 days a week, 5–6 days a week and every day; and (2) typical number of standard drinks (1 standard drink = 10 g alcohol) consumed on a drinking occasion: none, sip or taste, 1–2 drinks, 3–4 drinks, 5–6 drinks, 7–10 drinks, 11–12 drinks, ≥ 13 drinks.

Alcohol Dependence, Alcohol Abuse, and AUD

Experience of any symptoms of alcohol abuse, alcohol dependence, and AUD at wave 7 (mean age = 18.8 years) was measured by using the Diagnostic Interview Schedule for Children IV,²⁶ and an additional item used to assess craving corresponded to the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5)²⁷ AUD criteria. Binary variables (no or yes) were created to indicate whether each of the symptom items for alcohol abuse or dependence by *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) criteria or AUD by DSM-5 criteria had been experienced in the past 12 months.^{27,28} Three binary variables (no or yes) were then coded to indicate whether participants met DSM-IV criteria for alcohol abuse (at least 1 of 4 symptoms) and alcohol dependence (at least 3 of 7 symptoms) and DSM-5 criteria for AUD (at least 2 of 11 symptoms).

Wave 1 Characteristics

A range of sociodemographic, behavioral, and mental health wave 1 (mean age = 12.9 years) predictors of alcohol consumption identified from the literature were included in

analyses. These variables included: child factors (sex,^{21,29} externalizing and^{21,30} internalizing behaviors,^{30,31} problems socializing³²), parental factors (education,³³ religiosity,³⁴ alcohol accessible at home without parental knowledge,²¹ alcohol-specific rules,^{22,35} monitoring,²¹ responsiveness, demandingness, and consistency^{20,34}), family factors (socioeconomic status of area of residence,³³ household alcohol use,^{21,34} 1- or 2-parent household,²⁰ family conflict or positive relations,³⁶ family history of alcohol problems,³⁰ older siblings²⁹), and peer factors (peer alcohol and/or tobacco use and peer disapproval of alcohol and/or tobacco use^{21,29,30}). Full details of all variables included are presented elsewhere.^{24,25}

Statistical Analysis

We constructed parallel latent class growth models (1–6 classes) based on quantity (grouped as none, sips only, 1–4 drinks, 5–10 drinks, and ≥ 11 drinks) and frequency (grouped as never, less than monthly, monthly, fortnightly, and weekly or more frequent) of past-year alcohol use from wave 2 to wave 6. This quantity categorization reflected Australian guidelines for adults to minimize the risk of acute injury within a drinking session (≤ 4 standard drinks) and the threshold for a high-risk drinking session (≥ 11 drinks).³⁷ Our analyses were performed by using Mplus 7.3.³⁸ Within each latent class, we specified one set of growth parameters for quantity and one for frequency and used Vermunt's 3-step method³⁹ to account for classification uncertainty. We used 3 criteria for model selection.⁴⁰ The Akaike information criterion and the sample-size adjusted Bayesian information criterion (SABIC) were used to assess model fit; lower values indicated better fit. The Lo-Mendell-Rubin adjusted log-likelihood ratio test statistic⁴¹ was used to compare fit of a k -class model with that of a $k-1$ class model; $P < .05$ indicated that the

latter model should be rejected for the former. Entropy indexed class classification accuracy; higher values indicated better differentiation of individuals. Class composition of models was examined alongside fit statistics to determine the most parsimonious and meaningful class structure. The most likely trajectory group for each participant was used in subsequent analyses on the basis of the chosen model.

Stata 14⁴² was used for unadjusted and adjusted multinomial logistic regression analyses to predict trajectory membership (presented as relative risk ratios [RRRs]) by using predictors from wave 1. Adjusted binary logistic regression analyses were used to predict whether participants met DSM-IV criteria for alcohol dependence and alcohol abuse and DSM-5 criteria for AUD (presented as odds ratios [ORs]) at wave 7 by using trajectory membership as a predictor. All baseline covariates identified above were included in adjusted regression analyses. To align with recommendations to improve the reproducibility of scientific studies,⁴³ 99.5% confidence intervals (CI) are presented.

RESULTS

Quantity and Frequency of Consumption

Alcohol consumption increased overall from wave 2 to wave 6 (mean age = 13.9 and 17.8 years, respectively; see Supplemental Tables 4 and 5). Specifically, one-third (32.6%; $n = 595$) of participants had consumed alcohol on at least 1 occasion in the past 12 months at wave 2, increasing to 78.7% ($n = 1278$) at wave 6. For quantity of drinking, 8.0% ($n = 146$) of participants had consumed at least 1 standard drink on a typical drinking occasion in the past 12 months at wave 2, increasing to 70.0% ($n = 1136$) at wave 6. At wave 2, 2.0%

($n = 37$) consumed at least 4 standard drinks on a monthly or more frequent basis, which increased to 31.8% ($n = 498$) in wave 6.

Trajectories of Alcohol Consumption

Fit statistics for the 1- to 6-class parallel latent class growth models are shown in Table 1. The 5- and 6-class models did not yield valid model estimates because of singularity of the information matrix, and therefore these 2 models were rejected (Table 1). The 4-class model had the second smallest SABIC. The Lo-Mendell-Rubin adjusted log-likelihood ratio indicated improved model fit over the 3-class solution. Both the 3- and 4-class model had similar entropy. Examination of class composition supported selection of the 4-class model because each class was of substantive size and revealed distinct trajectories of alcohol consumption. The 4 classes identified were labeled as abstaining ($n = 352$; 19.4%), late-onset moderate drinking ($n = 503$; 27.7%), early-onset moderate drinking ($n = 663$; 36.6%), and early-onset heavy drinking ($n = 295$; 16.3%). Probabilities of endorsing different levels of drinking frequency and typical quantity for each class are summarized in Fig 1. Those reporting late-onset moderate drinking were selected as the reference class for all subsequent regression analyses because they most closely represent current Australian guidelines for adolescent alcohol consumption (delayed initiation of drinking until age 18)

and adult alcohol consumption (typically drinking no more than 4 standard drinks on a single occasion for anyone aged ≥ 18).³⁷ In the text below, we concentrate mainly on reporting adjusted analyses in which this group was compared with those groups displaying heavier drinking trajectories; comparisons with other groups as the reference class are available by inspecting Supplemental Tables 6 and 7, and unadjusted results are available in Supplemental Table 8.

Predictors of Alcohol Consumption Trajectory

Early-Onset Heavy Drinking Versus Late-Onset Moderate Drinking

Table 2 reveals the multinomial logistic regression after statistical adjustment. In the multivariate analyses, the following associations indicated decreased risk of early-onset heavy drinking: parental monitoring (RRR: 0.66; 99.5% CI: 0.47–0.92; $P = .001$) and alcohol-specific household rules (RRR: 0.31; 99.5% CI: 0.11–0.83; $P = .001$). Peer substance use (RRR: 3.43; 99.5% CI: 2.10–5.62; $P < .001$) was the only wave 1 factor associated with increased risk of early-onset heavy drinking relative to late-onset moderate drinking in adjusted analyses.

Early-Onset Moderate Drinking Versus Late-Onset Moderate Drinking

After statistical adjustment, no wave 1 factors retained associations indicating decreased risk of early-

onset moderate drinking. Peer alcohol and/or tobacco use (RRR: 1.72; 99.5% CI: 1.16–2.54; $P < .001$) was the only wave 1 factor associated with increased risk of early-onset moderate drinking in adjusted analyses (Table 2).

Trajectories of Alcohol Consumption as Predictors of Meeting Diagnostic and Statistical Manual of Mental Disorders Criteria for Alcohol Abuse, Dependence, and AUD Based on Self-Reported Symptoms

Results of the adjusted logistic regression models are presented in Table 3. Compared with those reporting late-onset moderate drinking, the early-onset heavy drinking class had higher odds of meeting *Diagnostic and Statistical Manual of Mental Disorders* criteria for alcohol dependence (OR: 4.04; 99.5% CI: 1.53–10.68; $P < .001$), abuse (OR: 6.05; 99.5% CI: 2.10–17.41; $P < .001$), and AUD (OR: 7.68; 99.5% CI: 2.41–24.47; $P < .001$) on the basis of self-reported symptoms at wave 7. Those reporting early-onset moderate drinking did not have higher odds of meeting *Diagnostic and Statistical Manual of Mental Disorders* criteria for alcohol abuse, dependence, or AUD compared with those reporting late-onset moderate drinking.

DISCUSSION

Over 7 annual waves of data, we identified (1) 4 distinct classes of alcohol use trajectories, (2) prospective predictors of these trajectories, and (3) associations between drinking trajectory and early-adulthood AUD symptoms. Parenting factors and peer influences at wave 1 (mean age = 12.9 years) were associated with reduced risk of early-onset heavy drinking (relative to late-onset moderate drinking). Household rules were associated with the greatest reduction in risk, with adolescents who had more alcohol-

TABLE 1 Parallel Latent Class Analysis Fit Statistics: Frequency and Quantity Model (Latent Class Growth Analysis; Linear)

Class	AIC	BIC	SABIC	LMR-ALRT	Entropy	Class Proportions					
						1	2	3	4	5	6
2	34 757	34 839	34 792	<.001	0.893	0.50	0.50	—	—	—	—
3	32 908	33 018	32 954	<.001	0.912	0.43	0.39	0.19	—	—	—
4	31 837	31 975	31 896	<.001	0.884	0.28	0.37	0.19	0.16	—	—
5 ^a	31 296	31 461	31 366	<.001	0.886	0.15	0.09	0.33	0.27	0.16	—
6 ^a	30 753	30 945	30 834	<.001	0.883	0.16	0.29	0.22	0.12	0.11	0.10

AIC, Akaike information criterion; BIC, Bayesian information criterion; LMR-ALRT, Lo-Mendell-Rubin adjusted log-likelihood ratio test; —, not applicable.

^a Did not yield valid model estimates because of singularity of information matrix.

Legend	Quantity	Frequency
■	11+ standard drinks	Weekly or more frequent
■	5 to 10 standard drinks	Fortnightly
■	1 to 4 standard drinks	Monthly
■	Sips only	Less than monthly
■	None	Never

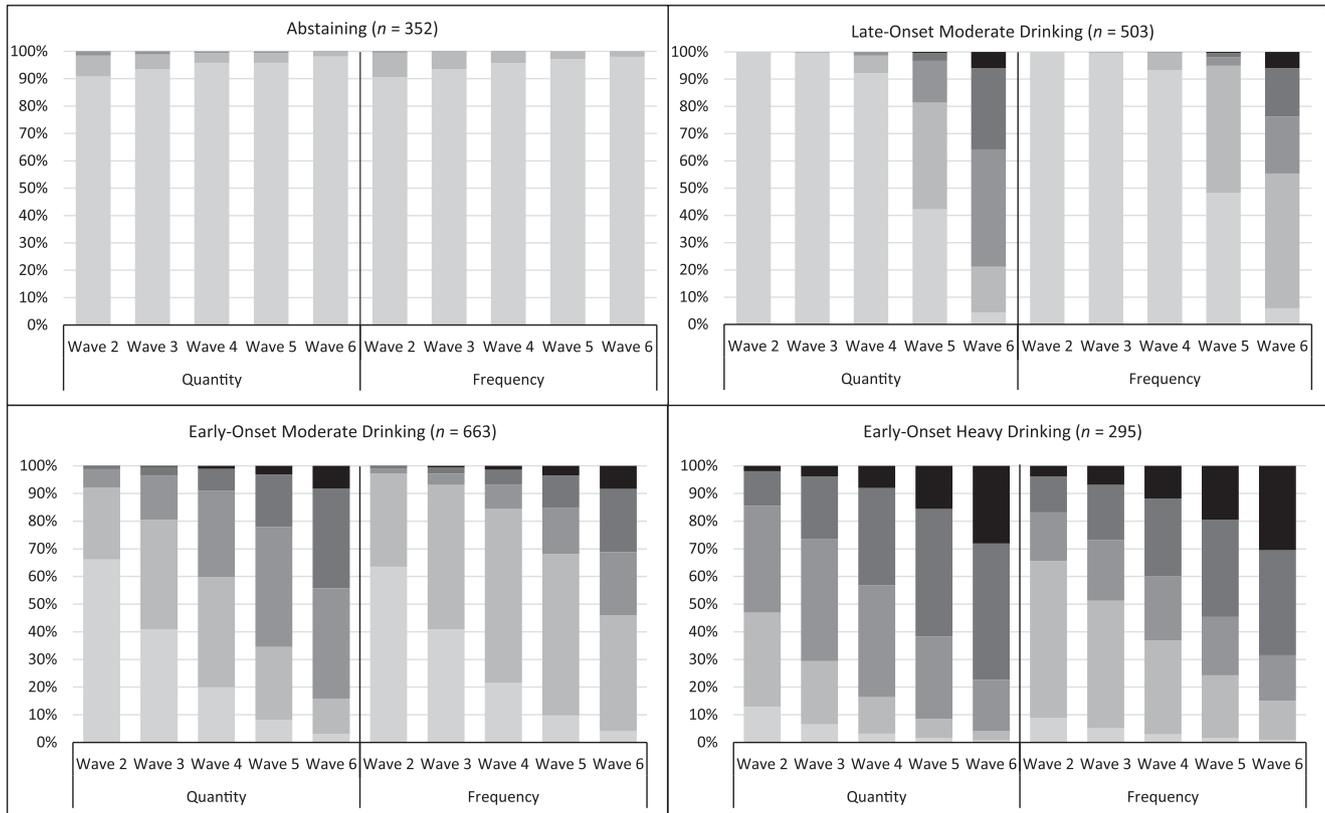


FIGURE 1 Probabilities of endorsing different levels of alcohol consumption quantity and frequency for each latent class.

specific household rules at age 12 being ~3 times less likely to belong to the early-onset heavy drinking class relative to the late-onset moderate drinking class. Adolescents with peers who drank and/or used tobacco had close to 4 times the risk of early-onset heavy drinking relative to late-onset moderate drinking. Similarly, adolescents with peers who drank and/or used tobacco had nearly twice the risk of early-onset moderate drinking relative to late-onset moderate drinking.

The early-onset heavy drinking class, in contrast to the late-onset moderate

drinking class, was associated with ~4 times the odds of meeting DSM-IV criteria for alcohol dependence, 6 times the odds of meeting DSM-IV criteria for alcohol abuse, and close to 8 times the odds of meeting DSM-5 criteria for AUD at wave 7 (mean age = 18.8 years). There were no differences in these outcomes between the early-onset moderate drinking class relative to the late-onset moderate drinking class, meaning that the timing of drinking onset for moderate drinkers had no bearing on these indicators of alcohol harm in early adulthood.

Strengths and Limitations

To our knowledge, with this study of youth, we are the first to (1) identify parallel trajectories of alcohol consumption frequency and quantity, and (2) apply understanding of different trajectories in alcohol involvement across adolescence to predict problematic alcohol use symptomatology at age 18 while adjusting for known confounders of adolescent drinking. Strengths of our study include the large sample size (>1800 adolescents), duration of the study (7 years), consistent annual follow-up periods, high retention rate

TABLE 2 Adjusted Multinomial Logistic Regression Predicting Latent Class Membership Using Baseline Characteristics

	Reference: Late-Onset Moderate Drinking					
	Early-Onset Moderate Drinking		Abstaining		Early-Onset Heavy Drinking	
	RRR	99.5% CI	RRR	99.5% CI	RRR	99.5% CI
Female sex	1.20	0.82–1.76	0.77	0.49–1.19	1.78	0.96–3.28
Importance of religion to parents (reference: no or a little)						
Pretty or very important	1.07	0.69–1.64	1.58	0.98–2.54	0.97	0.50–1.89
Parent born in Australia	0.90	0.58–1.40	0.84	0.51–1.40	1.23	0.58–2.59
Parent employment status (reference: employed)						
Unemployed, in workforce	0.96	0.53–1.73	1.00	0.51–1.97	0.79	0.30–2.12
Unemployed, not in workforce	0.68	0.29–1.58	1.52	0.63–3.67	0.78	0.22–2.76
Parent education (reference: high school or less)						
Diploma	0.77	0.47–1.27	0.72	0.42–1.25	1.23	0.58–2.63
University	0.90	0.55–1.45	0.61	0.34–1.07	0.95	0.43–2.07
Family history of alcohol problem	1.02	0.68, 1.52	0.86	0.54–1.36	1.16	0.63, 2.12
Single-parent household	1.24	0.75–2.04	0.89	0.48, 1.65	0.63	0.27–1.46
Smoking	0.65	0.02, 18.08	0.12	0.00–4.37	2.18	0.02–223.72
Parental monitoring	0.89	0.67, 1.17	0.95	0.69–1.3	0.66	0.47–0.92
Parent demandingness	1.01	0.81–1.26	1.28	0.97–1.69	0.99	0.72–1.37
Parent responsiveness	1.07	0.86–1.34	1.16	0.88–1.52	1.05	0.75–1.48
Parenting consistency	0.91	0.75–1.12	0.82	0.65–1.03	0.76	0.56–1.05
Household average alcohol use	0.98	0.81–1.18	0.9	0.65–1.2)	1.08	0.85–1.37
Home access	1.19	0.98–1.46	0.91	0.72–1.15	1.19	0.87–1.62
Alcohol-specific rules	0.45	0.19–1.07	0.6	0.21–1.72	0.31	0.11–0.83
Family positive relation	0.98	0.80–1.19	1.01	0.78–1.31	0.94	0.74–1.19
Family conflict	0.98	0.80–1.20	0.89	0.69–1.13	1.10	0.80–1.50
Externalizing	1.19	0.92–1.54	1.1	0.82–1.47	1.44	0.99–2.10
Anxious or depressed	0.88	0.66–1.15	0.98	0.72–1.32	0.76	0.48–1.21
Withdrawn or depressed	1.16	0.85–1.58	1.36	0.98–1.90	0.93	0.60–1.44
Peer substance use	1.72	1.16–2.54	0.66	0.38–1.16	3.43	2.10–5.62
Peer approval of substance use	0.96	0.76–1.22	0.88	0.68–1.15	0.77	0.57–1.06
Socioeconomic index for area	0.93	0.75–1.16	1.00	0.78–1.28	0.94	0.67–1.30

(77.5%), consideration of parent and child covariates associated with adolescent alcohol use, and the integration of both frequency and typical quantity of drinks in the analyses.

Our study has some limitations that need to be considered. We recruited via an opt-in process rather than randomly sampling from the population, which may indicate that our results are not generalizable at the population level. Additionally, our retrospective measures of alcohol use

may have led to underestimations of actual use, particularly at higher levels of alcohol consumption.⁴⁴ However, our cohort has a similar demographic spread to the Australian population for both parents and children, and rates of alcohol consumption are also consistent with rates observed in the Australian population,²⁴ although families with low socioeconomic status have been underrepresented in our cohort. The use of self-report measures for alcohol abuse, alcohol dependence, and AUD symptoms is another

limitation of our study, although levels of reported symptoms in our cohort are similar to those of community samples of young people in high-income countries.^{45,46} It is important to note, however, that the results of our study do not reflect a formal diagnosis of alcohol abuse, alcohol dependence, nor AUD; rather, there may be early signs indicative of potential clinical problems related to alcohol use.

Implications

With these caveats in mind, our findings can be interpreted to broadly support current Australian Government recommendations (no alcohol consumption before age 15, delaying alcohol initiation until age 18, and drinking no more than 4 standard drinks on a single occasion for people aged ≥ 18)³⁷ and align with other government

TABLE 3 Adjusted Logistic Regression Predicting Number of Alcohol Misuse Symptoms by Latent Class

Class (reference: late-onset moderate drinking)	Dependence		Abuse		AUD	
	OR	99.5% CI	OR	99.5% CI	OR	99.5% CI
Early-onset moderate drinking	1.43	0.82–2.51	1.45	0.79–2.67	1.57	0.93–2.66
Abstaining	0.22	0.08–0.61	0.13	0.03–0.59	0.18	0.09–0.37
Early-onset heavy drinking	4.04	1.53–10.68	6.05	2.1–17.41	7.68	2.41–24.47

recommendations, including those from Canada, Finland, Japan, Mexico, Singapore, and the United States.^{4,7} Additionally, the study findings are consistent with previous research in which early escalation of heavy drinking in adolescence was found to be associated with increased risk of alcohol misuse in early adulthood.^{6,48}

Given that parenting factors in early adolescence were associated with decreased risk of early-onset heavy drinking, it may be of importance for parents and caregivers of children entering adolescence to consider implementing household rules specific to alcohol use as a preventive measure against alcohol-related harm. Regarding peer influence, our findings are consistent with previous longitudinal research regarding peer selection and clustering of alcohol-using peers.⁴⁹ Our results support existing intervention strategies that are aimed at preventing and/or reducing adolescent alcohol use via the participation of peers.⁵⁰

Notably, less is known about whether adolescent drinking trajectories are likely to differ by sex. Previous studies have established that high-frequency and high-quantity drinking is more likely among adult^{51,52} and adolescent^{52,53} males compared with

females. Somewhat contrary to these findings, in our study, we found that sex was not associated with early-onset heavy drinking relative to late-onset moderate drinking. This finding may reflect a closing sex gap in alcohol use that has been observed in recent years.⁵⁴

CONCLUSIONS

This longitudinal cohort study provides evidence that alcohol-specific parenting factors and peer factors in early adolescence predict alcohol use trajectories. In particular, the implementation of alcohol-specific household rules for children entering adolescence may reduce the risk of early-onset heavy drinking and, in turn, reduce the risk of alcohol-related problems later in life. Indeed, early initiation and, importantly, rapid escalation of alcohol use are together associated with increased risk of experiencing alcohol-related problems in early adulthood. Our findings broadly support Australian Government recommendations for adolescents to delay initiation and drink in moderation to minimize later harm.

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ABBREVIATIONS

APSALS: Australian Parental Supply of Alcohol Longitudinal Study
AUD: Alcohol use disorder
CI: confidence interval
DSM-5: *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*
DSM-IV: *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*
OR: odds ratio
RRR: relative risk ratio
SABIC: sample-size adjusted Bayesian information criterion

Ms Yuen contributed to the analysis plan for this study, coordinated and conducted data collection, interpreted the statistical analyses, drafted the initial manuscript, and reviewed and revised the manuscript; Dr Chan conceptualized and designed the analysis plan, conducted and interpreted the statistical analyses, and critically reviewed the manuscript; Dr Bruno coordinated recruitment and baseline data collection, conceptualized and designed the analysis plan, interpreted the statistical analyses, and critically reviewed the manuscript; Mr Clare contributed to the analysis plan, cleaned the data, interpreted the statistical analyses, and critically reviewed the manuscript; Dr Mattick conceived of and developed the cohort, coordinated recruitment and baseline data collection, contributed to the analysis plan, and critically reviewed the manuscript; Ms Aiken coordinated recruitment and baseline data collection, coordinated and conducted subsequent follow-up data collection, cleaned the data, and critically reviewed the manuscript; Dr Boland and Ms De Torres coordinated and contributed to data collection in addition to critically reviewing the manuscript; Drs Kypri, Slade, Hutchinson, and Najman conceived of and developed the final methodology for this cohort, contributed to the analysis plan, and critically reviewed the manuscript; Drs McBride, McCambridge, and Horwood contributed to the analysis plan and critically reviewed the manuscript; Dr Peacock conceptualized and designed this study and the analysis plan, interpreted the statistical analyses, and critically reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the submitted work.

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