Parent characteristics associated with approval of their children drinking alcohol from ages 13 to 16 years: prospective cohort study

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Sonia Sharmin,[1] Kypros Kypri,[1] Monika Wadolowski,[2] Raimondo Bruno,[3] Masuma Khanam,[4] Alexandra Aiken,[5] Delyse Hutchinson,[6] Jackob M. Najman,[7] Tim Slade,[5] Nyanda McBride,[8] John Attia,[1] Richard P. Mattick[5]

Abstract

Objective: We investigated parent sociodemographic and drinking characteristics in relation to whether they approved of their children drinking at ages 13, 14, 15 and 16 years.

Methods: We collected data annually from 2010–2014, in which 1,927 parent–child dyads, comprising school students (mean age 12.9 years at baseline) and one of their parents, participated. Our operational definition of parental approval of children drinking was based on the behaviour of parents in pre-specified contexts, reported by children. We measured parents' drinking with the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) scale and performed logistic regression to estimate associations between exposures and each wave of outcomes.

Results: Parents' approval of their children's drinking increased from 4.6% at age 13 years to 13% at age 16 years and was more common in parents of daughters than parents of sons (OR 1.62; 95%CI: 1.23 to 2.12). Parents in low-income families (OR 2.67; 1.73 to 4.12), single parents (OR 1.62; 1.17 to 2.25), parents with less than a higher school certificate (OR 1.54; 1.07 to 2.22), and parents who drank more heavily (OR 1.17; 1.09 to 1.25) were more likely to approve of their child drinking.

Conclusions: Socially disadvantaged parents were more likely to approve of their children drinking alcohol.

Implications for public health: The findings identify high-risk groups in the population and may help explain the socioeconomic gradients in alcohol-related morbidity and mortality seen in many countries.

Key words: parent, socioeconomic status, drinking, approval, adolescent drinking

Risky drinking is a leading cause of the global disease burden borne by young people,[1,2] being a cause of neuropsychiatric conditions, injury and sexually transmitted infection.[1-4] In terms of acute harm, risky drinking is defined in the Australian health guidelines as consumption of more than four standard drinks (equivalent to >40g ethanol) on a single occasion.[5] In Australia, approximately 6% of boys and 5% of girls aged 12–17 years reported risky drinking in the preceding month,[6] while 15–19-year-olds have the highest incidence, across the population, of hospital admission due to risky drinking.[7]

Evidence shows that in addition to illegal access to commercial sources, adolescents (below the legal age of purchase, which is 18 in all Australian jurisdictions) obtain alcohol from peers, parents and other relatives.[8] Parents play an instrumental role in their children's behaviour in relation to alcohol.[9-11] The rules parents set and apply concerning alcohol seem to be an important influence[10-12] and may be a means of reducing the incidence of adolescent risky drinking.[13] A recent systematic review of longitudinal studies found that children whose parents set strict rules concerning alcohol were less likely to become risky drinkers later in adolescence.[14] Alcohol-specific rules pertain to clear, distinct guidelines concerning alcohol use, conveyed approval or disapproval of alcohol use, as well consistency in the use of punishments for infringing those rules.[13-15]

Evidence is accumulating on the role alcohol plays in population health, including its relationship with inequality.[16,17] In a study of mortality in Europe, Mackenbach and colleagues found that alcohol-related

1. Centre for Clinical Epidemiology and Biostatistics, School of Medicine and Public Health, University of Newcastle, New South Wales
2. Centre for Healthcare Resilience and Implementation Science, Australian Institute of Health Innovation, Macquarie University, New South Wales
3. School of Psychology, University of Tasmania
4. School of Health Science, University of Tasmania
5. National Drug and Alcohol Research Centre, University of New South Wales (UNSW)
6. Centre for Social and Early Emotional Development, School of Psychology, Deakin University, Victoria
7. Queensland Alcohol and Drug Research and Education Centre, University of Queensland
8. National Drug Research Institute, Curtin University, Western Australia
Correspondence to: Mrs Sonia Sharmin, CCEB, Level-4, HMRI Building, The University of Newcastle, Kookaburra Circuit, New Lambton Heights, NSW 2305; e-mail: Sonia.sharmin@uon.edu.au
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conditions contribute to inequalities in total mortality and concluded that "countering increases in alcohol-related mortality in lower socioeconomic groups is essential for reducing inequalities in mortality".[18] How parents socialise their children in relation to alcohol, the views they transmit about drinking, whether they give their children alcohol – and under what conditions – may contribute to this pattern of inequality.

Little is known about what parental characteristics predict approval of adolescent alcohol use.[19] There are, however, some clues from research examining associations between parent characteristics and adolescent risky drinking that suggest candidate variables. Parents are less likely to restrict their children's behaviour and more likely to relent to demands for alcohol as their children grow older.[20-22] Moreover, some research shows that parental approval of sipping alcohol increased as their children matured into adolescence, but that there was no increase in their approval of drinking or drunkenness with the child's age.[23] These studies did not investigate whether parent approval of children drinking in different contexts (i.e. supervised versus unsupervised) varied with adolescent age.

Reimullar et al.[24] found that parents in the US conveyed more permissive messages regarding alcohol to their daughters than to their sons, perhaps believing that girls are more likely to drink moderately. In addition, parent disapproval of children drinking has been found to be protective for both boys and girls, with the association being stronger for boys.[20,25] However, these studies did not examine whether gender differences were associated with parent approval of children drinking in supervised or unsupervised contexts.

Parents with low socioeconomic status (SES) have been found to be more approving of their children's drinking than parents with high SES.[26] However, the cross-sectional design of the study did not allow us to establish the temporal relation between these variables. A Finnish longitudinal study suggests a tendency for single parents to apply less restrictive alcohol rules to their children in a family setting;[27] however, no adjustment was made for potential confounders (i.e. sociodemographic factors). In addition, the study did not assess the possibility that the association may vary depending on whether children were allowed to drink outside of the family home, e.g. with friends at parties.

Studies of Dutch parents show that the more parents (both fathers and mothers) themselves drink, the less strict they are likely to be in relation to their children's drinking.[25,28] However, a study of a US cohort[29] showed that alcohol-specific rules were associated with mothers' drinking, but not with fathers' drinking. These studies also did not adjust for important potential confounders (e.g. sociodemographic and family factors), which may be inflated estimates of association. Additionally, they did not investigate the association between parental alcohol use and their approval of children drinking across different contexts.

There is little research investigating whether parents' approval of their children's drinking varies according to parent characteristics, and we have found no such studies conducted in Australia. We tested the hypotheses that parents are more likely to approve of their child drinking in pre-specified contexts:

- if their child is older;
- if the child is a daughter rather than a son;
- if the parent is less educated or has lower household income;
- if they are in a single-parent household rather than a two-parent household; and
- if the parent drinks more alcohol.

Methods

Design and procedure

This is part of the Australian Parental Supply of Alcohol Longitudinal Study (APSALS), established in 2010, in which we recruited parent–child dyads from 49 schools in Western Australia, New South Wales and Tasmania. The methods have been described in detail[30] and we summarise them below. We registered the study at ClinicalTrials.gov (NCT02280551) and the University of New South Wales Human Research Ethics Committee approved the protocol.[30]

The cohort consisted of 1,927 parent-child dyads, recruited in 2010 and 2011 from Grade 7 classes. Initially, we distributed 5,759 study information packs and 2,017 parent–child dyads conveyed interest in the study. Of these, 90 dyads were deemed ineligible, because 74 parents did not return informed consent forms and 16 adolescents were not in Grade 7, yielding 1,927 dyads for inclusion in the study. Adolescents and parents completed questionnaires separately, either on paper or on-line. The Wave 1 (baseline) demographic characteristics of this cohort (shown in Supplementary Table 1), were broadly similar to those of the Australian population at the time of data collection: 45% of adolescents were female (versus 49% in the Australian population of the same age); 80% were from two-parent households (versus 81%); 65% of parents had post-high school degrees (versus 67%); 81% of parents were employed (versus 88%); and 73% of the parents were Australian-born (versus 72%).[31-33]

Participants

We used adolescent and parent data from four annual assessment waves in which adolescents had mean ages of 13, 14, 15 and 16, respectively, with a standard deviation of 0.5 or 0.6 years at each wave. The retention rate was >85% throughout the four annual waves. At Wave 1, the mean age of parents was 44 years (standard deviation 5.4 years) and 87% of responding parents were mothers. We included participants who completed questionnaires at each wave in the analysis. Of these, 1,913 parents (99%) and 1,910 adolescents (99%) completed questionnaires at Wave 1; 1,827 parents (95%) and 1,836 adolescents (95%) completed questionnaires at Wave 2; 1,776 parents (92%) and 1,776 adolescents (92%) completed questionnaires at Wave 3; while 1,731 parents (90%) and 1,705 adolescents (89%) completed questionnaires at Wave 4.

Measures

Outcome variable

Parent approval of their child drinking at each wave: We determined whether each parent approved of their child drinking using four items from a 10-item scale concerning alcohol-specific rules:[13]

- I am allowed to drink alcohol at home when my parents are around
- I am allowed to drink more than one glass of alcohol when my parents are around
- I am allowed to drink alcohol at home when my parents are not around
- I am allowed to drink alcohol with my friends at a party

We did not use the remaining six items to produce the outcome variable because only a small number of adolescents reported parent approval of alcohol use in the contexts they covered. Additionally, two of these six items did not measure whether parent approval occurred in supervised or unsupervised

contexts. We dichotomised response options: categorising *always, often* and *sometimes* as *approval*; and *rarely*, and *never* as *disapproval*. We grouped the *often* and *sometimes* categories with *always* because these categories indicated parents' implicit approval of children drinking.

Exposure variables

Household income: We determined the categories of household income from the Australian Taxation Office tax brackets in the year we started the research (2009). For the analyses, we combined the two top income categories and termed them high income (≥$81,000), while the other two categories were middle ($35,000–$80,999) and low income (up to $34,999).

Household composition: At each wave we asked adolescents which family members they lived with most of the time and categorised response options as *single-parent household* or *two-parent household*. Single-parent households included any single parent (including step-parents), while two-parent households referred to households that included a father and mother, father and step-mother, or mother and step-father.

Parents' education: We asked parents at each wave about their highest educational qualification and categorised responses as: *school certificate or below, higher school certificate or diploma (trade or non-trade),* and *university-level degree*.

Parent alcohol use: We assessed parent alcohol use with the three-item AUDIT-C,[34] with higher scores indicating heavier consumption.

Confounders

We theorised the nature of the links between exposure, confounder and outcome variables using directed acyclic graphs (DAGs).[35] The confounders we adjusted for in the analyses have been found to be associated with exposure and/or outcome variables. We also hypothesised potential intermediate variables using DAGs. We did not include these in the model to avoid over-adjustment, which would usually bias estimates toward the null.[36]

We theorised that no adjustment was necessary to estimate associations between *adolescent gender*, *household income*, and *parents' education* with parent approval of alcohol use. To obtain an unconfounded estimate of the association between household composition and parent approval of alcohol use, we adjusted for other parent factors at each wave, including religiosity,[37] education,[26] income level[26] and employment status[38] (Supplementary Figure 1). We also adjusted analyses for the following confounders while estimating the association between parent alcohol use and approval of drinking at each wave: parent factors (age,[39] religiosity,[40] education,[26,41] employment status,[39] income level[26,41]); and family factors (family history of heavy drinking,[42] household composition,[27,41] family conflict[43] and positive family relationships[43]), see Supplementary Figure 2.

Religiosity: At Wave 1, we asked parents how important religion was in their lives with response options ranging from *not important* to *very important*.[44]

Parents' employment status: We asked parents at each wave, "Which best describes your current employment?" with the response options: *unemployed* and *employed*.

Family history of heavy drinking: At Wave 1, we asked parents whether their child's grandparents, aunts or uncles (on either side) ever drank heavily, with response options *yes, no* and *I don't know*. This section of the questionnaire included a 'standard drinks guide' developed by the Australian government,[45] but no further definitions were provided.

Family conflict and positive relations: We used three items to measure family conflict: "Family members have big arguments over little things"; "Family members get angry with each other daily"; and "Family members get angry with each other three times a week",[46] with response options *yes* or *no*. Scores ranged from 3 to 6, with higher scores indicating greater family conflict (Cronbach's alpha 0.55).[47]

We measured positive family relations using three items: "Family members support one another"; "There are feelings of togetherness in our house"; and "Family members get along well".[46] Response options were dichotomised as *yes* or *no* and scores ranged from 3 to 6. Higher scores indicated more positive relations in the family (Cronbach's alpha 0.74).[47]

Analysis

We calculated the proportion of parents who approved of their children drinking and undertook planned cross-sectional univariate logistic regression analyses to test for associations of adolescent gender, household income and parent education with parent approval of alcohol use at each wave. We then conducted fully planned multivariable logistic regression analyses to test for associations between household composition and parent alcohol use with parent approval of their child's alcohol use, to adjust for confounders. Additionally, we fitted an interaction term to test whether the effect of parent characteristics on parent approval of their child's alcohol use varied over time. We adjusted for clustering at the school level, tested for multicollinearity and conducted our analyses in Stata/SE 13.1,[48] using the *logistic* and *cluster* commands. We report the results as odds ratios (ORs) and 95% confidence intervals, with a two-sided $p<0.05$ indicating significance.

Missing data

In our data set, 8% of cases had missing data on one or more variables. For any single variable, the highest proportion of missing data was 3%. Accordingly, we performed analyses on complete case data to estimate associations.

Results

Table 1 shows that a small proportion of children reported that their parents approved of them drinking. Parent approval increased over time across the four contexts, particularly from age 15 to 16 years, when proportions doubled. Parent approval of their child drinking in unsupervised settings also increased: 1% at age 13 years were allowed to drink at home when their parents were

Table 1: Proportion of adolescents reporting parent approval of their use of alcohol in different contexts over time.

Context	Data collection wave and child cohort mean age in years, %			
	Wave 1 13	Wave 2 14	Wave 3 15	Wave 4 16
I am allowed to drink alcohol at home when my parents are around	4.6	5.0	6.9	13
I am allowed to drink more than one glass of alcohol at home when my parents are around	0.4	1.4	3.5	7.1
I am allowed to drink alcohol at home when my parents are not around	1.0	1.9	1.5	2.8
I am allowed to drink alcohol with my friends at a party	0.7	2.1	3.9	11

not present, increasing to 3% at age 16 years. Parent approval of their child drinking with friends at a party also increased three-fold from ages 15 to 16 years.

Parent approval of their child drinking at home under supervision

Table 2 shows that parents were more approving of girls drinking than of boys drinking, and this association was strongest at age 16 years. Compared with high-income families, parents in low- or middle-income families were more likely to approve of their children drinking at home, particularly in later waves. Single parents were more likely to approve of their children drinking at home than were parents in two-parent families. In Wave 4, when children were aged 16 years, parents with a university degree were less approving of their children drinking than were parents with less education. Parents' own drinking was positively associated with their approval of their children drinking. There was no consistent pattern in the interaction terms to suggest that these associations changed markedly from wave to wave.

Parent approval of their child drinking with friends at a party

The point estimates in Table 3 suggest the possibility that parents were more inclined to allow their daughters than their sons to drink with friends; however, none of the main effects, nor the interactions, were statistically significant. Compared with parents in the high-income group, those in low- and middle-income groups were more likely to approve of their children drinking with friends at a party. Compared with parents in two-parent families, single parents were more likely to approve of their child drinking with friends at a party. Parents with a university degree were less likely to approve of their child drinking compared with parents who held a high school certificate or a trade diploma, and the associations were strongest at ages 15 and 16 years. Parent alcohol use was also positively associated with their approval of their child drinking with friends at a party at ages 15 and 16 years, and this association strengthened over time, as seen in interaction terms for Waves 3 and 4.

We examined associations between parent characteristics and approval of their children's

Table 2: Parent characteristics predicting their approval of their child's drinking at home under parental supervision.

Parent characteristics	Wave 1 (M adolescent age=13 years)		Wave 2 (M adolescent age=14 years)		Wave 3 (M adolescent age=15years)		Wave 4 (M adolescent age=16 years)	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Gender of child[(A)]								
Boy	Reference		Reference		Reference		Reference	
Girl	1.21 (0.83, 1.77)	*p*=0.315	1.36 (0.81, 2.28)	*p*=0.239	1.44 (0.93, 2.23)	*p*=0.099	1.62 (1.23, 2.12)	*p*=0.001
Household income[(P)]								
High (≥$81,000)	Reference		Reference		Reference		Reference	
Middle ($35,000-$80,999)	1.27 (0.75, 2.14)	*p*=0.369	1.60 (0.88, 2.91)	*p*=0.122	2.01 (1.37, 2.94)	*p*<0.001	1.76 (1.24, 2.50)	*p*=0.002
Low (<$35,000)	1.71 (0.82, 3.57)	*p*=0.150	2.36 (1.22, 4.49)	*p*=0.010	3.77 (2.39, 5.95)	*p*<0.001	2.67 (1.74, 4.13)	*p*<0.001
Household composition[(A)b]								
Two-*parent* household	Reference		Reference		Reference		Reference	
Single-*parent* household	1.75 (1.06, 2.90)	*p*=0.029	1.30 (0.74, 2.29)	*p*=0.365	1.48 (1.03, 2.12)	*p*=0.033	1.52 (1.03, 2.24)	*p*=0.036
Parents' education[(P)]								
School Certificate or below	1.43 (0.77, 2.65)	*p*=0.257	2.01 (1.20, 3.35)	*p*=0.008	1.32 (0.77, 2.28)	*p*=0.315	1.48 (1.05, 2.09)	*p*=0.027
High school certificate or Diploma	Reference		Reference		Reference		Reference	
University level degree	1.12 (0.65, 1.94)	*p*=0.677	1.05 (0.60, 1.83)	*p*=0.863	0.77 (0.46, 1.29)	*p*=0.320	0.70 (0.49, 0.98)	*p*=0.041
Parents' alcohol use[(P)c] (AUDIT-C Score:0-12)	1.08 (0.99, 1.19)	*p*=0.096	1.16 (1.03, 1.31)	*p*=0.018	1.09 (1.01, 1.17)	*p*=0.031	1.11 (1.03, 1.18)	*p*=0.004
Interaction between parent characteristics and wave								
Gender of child*wave								
Boy	Reference	-	Reference	-	Reference	-	Reference	-
Girl	Reference	-	1.06 (0.61, 1.83)	*p*=0.840	1.05 (0.61, 1.80)	*p*=0.864	1.24 (0.76, 2.02)	*p*=0.397
Household income*wave								
High (≥$81,000)	Reference	-	Reference	-	Reference	-	Reference	-
Middle ($35,000-$80,999)	Reference	-	1.25 (0.61, 2.56)	*p*=0.536	1.63 (0.85, 3.10)	*p*=0.140	1.33 (0.69, 2.58)	*p*=0.395
Low (<$35,000)	Reference	-	1.22 (0.38, 3.89)	*p*=0.742	3.29 (1.21, 8.87)	*p*= 0.019	1.56 (0.61, 4.01)	*p*=0.357
Household composition*wave								
Two-*parent* household	Reference	-	Reference	-	Reference	-	Reference	-
Single *parent* household	Reference	-	0.76 (0.38, 1.52)	*p*=0.443	0.56 (0.25, 1.25)	*p*=0.154	0.75 (0.36, 1.56)	*p*=0.438
Parents' education*wave								
School Certificate or below	Reference	-	1.28 (0.59, 2.77)	*p*=0.530	0.86 (0.38, 1.93)	*p*=0.710	0.95 (0.47, 1.94)	*p*=0.894
High school certificate or Diploma	Reference	-	Reference	-	Reference	-	Reference	-
University level degree	Reference	-	0.94 (0.50, 1.76)	*p*=0.850	0.85 (0.40, 1.81)	*p*= 0.670	0.66 (0.35, 1.23)	*p*=0.189
Parents' alcohol use*wave	Reference	-	1.05 (0.94, 1.18)	*p*=0.365	1.00 (0.90, 1.10)	*p*=0.931	1.04 (0.93, 1.17)	*p*=0.467

Notes:

(A), Adolescent report; (P), Parent report

b: Adjusted for religiosity, education, income level and employment status variables (see Supplementary Figure 1)

c: Adjusted for religiosity, education, employment status, income level, family history of heavy drinking, household composition, family conflict and positive relations (see Supplementary Figure 2)

**signifies an interaction between parent characteristics and wave*

alcohol use in two further contexts: drinking more than a glass of alcohol at home under parental supervision, and drinking at home with no parental supervision. Results followed a similar pattern to those already presented, except for parent approval of daughters versus sons drinking in unsupervised settings, where there was no pattern by age. The variance inflation factors ranged from 1.01 to 1.36, with a mean of 1.10, suggesting multicollinearity was low and that the adjusted regression models were stable.

Discussion

Overall, parents' approval of their children's alcohol use, in a range of contexts, was low. It increased as children got older and was more likely for daughters than sons. Low- and middle-income families, less-educated parents, single parents and parents who drank more heavily were more likely to approve of their child drinking. The effect size relating to low-income families was relatively large, making it the strongest predictor of parent approval. Not all associations retained statistical significance after adjustment for confounders; however, point estimates remained in the hypothesised direction across the four contexts.

Strengths of the study include the use of a large cohort of adolescents and their parents, with high retention. In addition, we were able to estimate associations in four annual waves allowing an analysis of change over an important period of human development in relation to alcohol.[49] We drew on both parent and adolescent reports to measure parent characteristics, reducing the risk that associations merely reflect participant beliefs about the nature of the associations under study.

Limitations principally relate to selection, measurement and confounding. The self-selected sample constrains generalisation to an uncertain extent. While the distributions of participant demographic characteristics were similar to those in the Australian population at the time of the study, the findings cannot be relied upon to estimate prevalence because the cohort was not randomly selected from a specified population.[36] Given the heterogeneity in the cohort in relation to the exposures of interest, the associations

Table 3: Parent characteristics predicting their approval of their child's drinking with friends at a party.

Parent characteristics	Wave 1 (M adolescent age=13 years)		Wave 2 (M adolescent age=14 years)		Wave 3 (M adolescent age=15years)		Wave 4 (M adolescent age=16 years)	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Gender of child[(A)]								
Boy	Reference		Reference		Reference		Reference	
Girl	1.65 (0.47, 5.75)	*p*=0.435	0.97 (0.52, 1.80)	*p*=0.930	1.46 (0.94, 2.26)	*p*=0.093	1.41 (0.99, 2.01)	*p*=0.057
Household income[(P)]								
High (≥$81,000)	Reference		Reference		Reference		Reference	
Middle ($35,000-$80,999)	1.56 (0.55, 4.43)	*p*=0.402	2.33 (1.22, 4.47)	*p*=0.011	2.53 (1.47, 4.35)	*p*=0.001	1.84 (1.31, 2.58)	*p*<0.001
Low (<$35,000)	3.42 (1.01, 11.7)	*p*=0.049	3.00 (1.17, 7.71)	*p*=0.023	5.46 (2.87, 10.4)	*p*<0.001	2.92 (1.96, 4.37)	*p*<0.001
Household composition[(A)b]								
Two-*p*arent household	Reference		Reference		Reference		Reference	
Single-*p*arent household	1.64 (0.47, 5.71)	*p*=0.440	1.19 (0.50, 2.82)	*p*=0.700	1.83 (1.09, 3.08)	*p*=0.022	1.62 (1.17, 2.25)	*p*=0.004
Parents' education[(P)]								
School Certificate or below	1.57 (0.50, 4.93)	*p*=0.444	1.66 (0.77, 3.58)	*p*=0.192	0.80 (0.41, 1.57)	*p*=0.516	1.54 (1.07, 2.22)	*p*=0.020
High school certificate or Di*p*loma	Reference		Reference		Reference		Reference	
University level degree	0.57 (0.16, 2.01)	*p*=0.385	0.40 (0.14, 1.02)	*p*=0.055	0.26 (0.13, 0.50)	*p*<0.001	0.62 (0.39, 0.98)	*p*=0.041
Parents' alcohol use[(P)c] **(AUDIT-C Score:0-12)**	0.84 (0.66, 1.07)	*p*=0.160	1.01 (0.88, 1.17)	*p*=0.846	1.10 (1.02, 1.19)	*p*=0.010	1.17 (1.09, 1.25)	*p*<0.001
Interaction between parent characteristics and wave								
Gender of child*wave								
Boy	Reference	-	Reference	-	Reference	-	Reference	-
Girl	Reference	-	0.47 (0.15, 1.52)	*p*=0.208	0.79 (0.23, 2.71)	*p*=0.704	0.80 (0.23, 2.78)	*p*=0.728
Household income*wave								
High (≥$81,000)	Reference	-	Reference	-	Reference	-	Reference	-
Middle ($35,000-$80,999)	Reference	-	1.83 (0.50, 6.70)	*p*=0.361	1.75 (0.51, 6.03)	*p*=0.375	1.43 (0.40, 5.10)	*p*=0.577
Low (<$35,000)	Reference	-	0.97 (0.14, 6.75)	*p*=0.975	1.81 (0.32, 10.2)	*p*=0.499	1.25 (0.20, 7.75)	*p*=0.809
Household composition*wave								
Two-*p*arent household	Reference	-	Reference	-	Reference	-	Reference	-
Single *p*arent household	Reference	-	0.82 (0.15, 4.46)	*p*=0.864	1.25 (0.25, 6.21)	*p*=0.782	0.91 (0.19, 4.29)	*p*=0.903
Parents' education*wave								
School Certificate or below	Reference	-	1.05 (0.33, 3.34)	*p*=0.936	0.42 (0.10, 1.83)	*p*=0.251	0.98 (0.27, 3.41)	*p*=0.947
High school certificate or Di*p*loma	Reference	-	Reference	-	Reference	-	Reference	-
University level degree	Reference	-	0.82 (0.17, 3.96)	*p*=0.805	0.56 (0.13, 2.44)	*p*=0.439	1.13 (0.32, 3.99)	*p*=0.846
Parents' alcohol use*wave	Reference	-	1.26 (0.94, 1.68)	*p*=0.126	1.41 (1.05, 1.90)	*p*=0.024	1.54 (1.21, 1.96)	*p*<0.001

Notes:

(A), Adolescent report; (P), Parent report

b: Adjusted for religiosity, education, income level and employment status variables (see Supplementary Figure 1)

c: Adjusted for age, religiosity, education, employment status, income level, family history of heavy drinking, household composition, family conflict and positive relations (see Supplementary Figure 2)

**signifies an interaction between parent characteristics and wave*

estimated here are arguably generalisable to populations with similar drinking cultures.

We measured parent characteristics (but not the gender of their child) by asking the participating parents, who were usually mothers. Fathers were underrepresented, such that our results may be biased. Our operational definition of parental approval was based on the behaviour of parents, reported by children. It does not account for the possibility that parents allowed their children to drink in some circumstances, despite disapproving of their drinking, as a means of preventing riskier behaviour, e.g. drinking at parties.

We relied on adolescent reports regarding the extent to which their parents approved of their alcohol use, and these may not reflect actual parent behaviour. Some studies show large disparities between children's and parents' perceptions of alcohol-related behaviour, including whether drinking is supervised.[50] Conversely, adolescents' subjective understanding of parent behaviour may be as, or more, important than the actual behaviour.[51]

As in any study in which exposures are not randomly allocated, it is likely that unmeasured or incompletely adjusted confounders have biased estimates of association.[36] We sought to protect against model misspecification and 'cherry picking' by pre-specifying directed acyclic graphs to guide the analysis.

We considered employment a potential confounder and adjusted for it in the associations between household composition, parental alcohol use and parental approval of their children drinking. We found that adjusting for employment in the analyses did not change the results much. Thus, we judged that analysing categories of employment (i.e. part-time, shift workers, casual employment) unwarranted. In any case, we did not have the data necessary to examine associations with subcategories of employment status.

We cannot ignore the possibility of more complex explanations for the associations. Some behaviours may mediate the association between parent characteristics and their approval of children drinking. For instance, parents from low SES households may be more likely to drink and thus be more approving of their children drinking at a younger age.

Results addressing our first hypothesis are consistent with previous research, i.e. parents do less monitoring and permit greater autonomy as their children get older.[52,53] The result is also consistent with research on alcohol-specific parenting, showing greater permissiveness toward children drinking as they age.[22]

Parents of daughters were more likely to approve of them drinking in supervised settings, or with friends at parties, than were parents of sons (hypothesis 2). This is consistent with US research showing that parents employed more restrictive strategies for sons than daughters.[29] It may reflect a tendency to respond to externalised symptoms and behavioural undercontrol more in boys than in girls,[54] reflecting a belief that boys are at greater risk of harm from drinking than girls are.

In relation to hypothesis 3, lower educational attainment and parent income were associated with greater approval of their children drinking. A similar finding was reported in a Dutch study,[26] in which higher socioeconomic status was associated with the imposition of stricter rules concerning children's access to alcohol. In relation to hypothesis 4, single parents were more likely to approve of their children drinking than were parents in two-parent households. This finding is congruent with Finnish research[27] showing that single parents were more permissive than parents in two-parent households.

Finally, in relation to hypothesis 5, parents who drank alcohol were more approving of their children drinking *per se*, and their approval of their children drinking with friends at parties increased over time. Parents who are frequent drinkers may consider themselves less credible in setting alcohol rules[25] and as a consequence be more lenient.

We found a significant increase in parent approval of alcohol use when adolescents were 15 and 16 years old. In addition, parent characteristics and approval of their children's drinking were strongly associated in these older children. These findings are worth considering in the context of the current Australian *Guidelines to Reduce Health Risks from Drinking Alcohol*.[5] While the guidelines recommend that those aged under 18 years do not consume alcohol, they acknowledge that drinking is common among 15–17-year-olds in Australia. They note that while "the safest option is to defer the onset of alcohol consumption as long as possible", if drinking is to occur, "it should be at a low risk level and in a safe environment, supervised by adults".[5] Our findings suggest that many parents consider it appropriate for 15- and 16-year-olds to drink without adult supervision, which perhaps should be a focus for intervention urging compliance with the current guidelines.

Thirteen per cent of 16-year-olds in this study reported that their parents allowed them to drink at home under their supervision and almost as many (11%) indicated that they had been allowed to drink "more than one glass". For many 16-year-olds, particularly those with lower body weight, a full glass of wine or beer would be enough to feel the effects of alcohol and to worsen their cognitive and motor skills.[55] There is also evidence that early onset of alcohol use can increase the risk of developing alcohol use disorder, and this risk is likely to be elevated among adolescents who live in home environments that are permissive of drinking.[56]

The findings may inform targeted primary and secondary prevention strategies, particularly for parents, but they also highlight concerns about current policy settings. In Australia, alcohol is more widely available than ever and it is cheaper relative to income than it has been in decades.[57] In addition, alcohol is promoted extensively to children via broadcast advertising,[58] sponsorship of sport[59] and through social media.[60]

Conclusion

In addition to directly stimulating demand in children, ready availability and promotion of alcohol may be shaping the behaviour of the most vulnerable parents in ways that facilitate their children's access to alcohol and the formation of beliefs that support earlier initiation and riskier drinking. Such processes may underpin the socioeconomic gradient in alcohol-related morbidity and mortality seen in many countries.[18]

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Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Table 1: Socio-demographic characteristics of the cohort of wave 1.

Supplementary Figure 1: Directed acyclic graph (DAG) of household composition and parent approval of child's alcohol use.

Supplementary Figure 2: Directed acyclic graph (DAG) of parent's alcohol use and parent approval of child's alcohol use.