

Alcohol Use in Films and Adolescent Alcohol Use

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abstract

OBJECTIVES: To investigate whether exposure to alcohol use in films (AUFs) is associated with early alcohol use, binge drinking, and alcohol-related problems in British adolescents.

METHODS: Cross-sectional study with 5163 15-year-olds from the Avon Longitudinal Study of Parents and Children in the United Kingdom. We measured adolescent exposure to AUFs, age at onset of alcohol use, and binge-drinking behavior. We adjusted for early childhood social, family and behavioral factors, adolescent tobacco use, and peer drinking.

RESULTS: After adjustment, adolescents with the highest exposure to AUFs were 1.2 (95% confidence interval [CI]: 1.1–1.3) times more likely to have tried alcohol compared with those least exposed and 1.7 (95% CI: 1.5–2.0) times more likely to binge drink. They were 2.4 (95% CI: 1.9–3.1) times more likely to drink weekly and 2.0 (95% CI: 1.7–2.4) times more likely to have alcohol-related problems than those least exposed.

CONCLUSIONS: Exposure to AUFs is associated with higher risk of alcohol use and alcohol-related problems in UK adolescents. Our findings provide evidence to support the argument that a review of film-rating categories and alcohol ratings for all films may help reduce problem-related alcohol consumption in young people.

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WHAT'S KNOWN ON THIS SUBJECT: Exposure to risky behavior in the media is associated with increased risky behavior during adolescence. To date, published studies have not adjusted results for early childhood confounders in this literature.

WHAT THIS STUDY ADDS: Our findings confirm associations between adolescent alcohol use in the United Kingdom and exposure to alcohol use in films consistent with other global studies, even after controlling for early childhood confounding influences.

Exposure to risky behavior in the media is associated with increased risky behavior during adolescence.¹ Cross-sectional and longitudinal associations have been reported for the relationship between exposure to alcohol use in films (AUFs) and alcohol use and binge drinking²⁻⁷ and alcohol-related social problems⁷ among adolescents in the United States and Germany. In the United States, AUF was also associated with expectancies of (perceptions of the personal benefits) and willingness to use alcohol and attitudes associated with alcohol consumption.⁸ Direct relationships between AUF, alcohol use without parental knowledge, and binge drinking were recorded for German adolescents⁴ after adjusting for confounders or mediators that included peer alcohol use⁸ and parental media viewing restrictions.^{2,3,9} Adolescents subjected to viewing restrictions were older when they first drank alcohol and at less risk of binge drinking compared with those with unrestricted viewing.¹⁰ Individual characteristics (eg, self-control and sensation seeking) have been shown to mediate associations between AUF and adolescent drinking⁵ although, counterintuitively, risk of alcohol onset was increased in low rather than high sensation seekers.¹¹

In the United Kingdom, inappropriate alcohol consumption is a major public health problem,¹² and in 2004 the UK government acknowledged the importance of reducing its consumption in children and adolescents.¹³ Between 1989 and 2008, 72% of the most popular UK box office films depicted alcohol use, but only 6% were classified as adult only.¹² This loophole in the UK film ratings system exposes many adolescents to AUF and may therefore contribute to adolescent alcohol use and subsequent alcohol-related problems. However, to our knowledge, there is little evidence to support or refute such associations in the United Kingdom. One study¹⁴

revealed an association between exposure to AUF during adolescence and alcohol use in youths aged 19 years in Scotland. Another examined alcohol use in young European adolescents aged 12 to 14 years (including over 1200 from Scotland) and concluded that, even after adjustment for a range of contemporaneous confounders, exposure to AUF was associated with an increased risk of trying alcohol and binge drinking.¹⁵ Neither these nor any of the other previously published studies has adjusted for the many early childhood exposures and characteristics that might affect life course trajectories and confound the movie alcohol exposure–youth alcohol consumption association. We used data collected prospectively during pre- and postnatal and early childhood assessments from a large UK cohort, the Avon Longitudinal Study of Parents and Children (ALSPAC) to examine associations between exposure to AUF and adolescent alcohol use at 15 years after adjusting for early childhood confounding influences.

METHODS

ALSPAC is a prospective study investigating social, environmental, biological, and genetic influences on the health and development of children and is described in detail elsewhere.^{16,17} Briefly, 14 541 pregnant women living in a Bristol-based health district in the former County of Avon, United Kingdom, with an expected delivery date between April 1, 1991, and December 31, 1992, joined the study. Detailed information has been collected from mothers and children by using data extracted from medical notes, linkage to routine information systems, and research clinics for study children. Mothers consented to join the study at recruitment while study children provided assent to participate until age 16 and subsequently have provided their own consent. Ethical

approval for the study was obtained from the ALSPAC Law and Ethics Committee and Local Research Ethics Committee.

Measurement

Exposure to Alcohol in Films

In the follow-up clinic for participants at age 15 years, a computer-assisted interview (CASI) asked adolescents whether they had seen 50 randomly selected films from a list of 366 popular contemporary films. The amount of time alcohol use was depicted in each film was recorded in seconds and total exposure was the sum of durations in each film the adolescent had seen. This method is described in detail elsewhere.¹⁸ In the current study, AUF was total exposure categorized into quartiles (≤ 27 minutes, 28–44 minutes, 45–63 minutes, ≥ 64 minutes).

Alcohol Use

The CASI asked participants about alcohol use. Four dichotomous outcome variables were derived: alcohol onset (“...ever had a whole drink?”), current alcohol use (those answering “yes” to the previous question were asked whether they “...only ever tried drinking alcohol once or twice,” “...used to drink alcohol but never drink now,” “...drink alcohol ...less than once a week,” “...usually drink alcohol on one/two days a week,” “...usually drink alcohol more than 2 days a week but not every day,” or “...usually drink alcohol every day”). Items were combined so never drinking or drinking less than weekly was categorized as “none or less than once a week,” whereas those drinking at least weekly were categorized as “more than once a week.” The third outcome measured binge drinking in the last 2 years (“...ever had 5 or more drinks in 24 hours?” and “If so, how many times?”: items were combined to create a variable with categories “no binge-drinking” versus “had 5 or more drinks in 24 hours at least once”). The fourth outcome was

“alcohol leading to problems in last two years” (eg, alcohol-related arguments, police problems, drinking in hazardous situations, interference with school, work, or leisure, drinking despite problems, tolerance, withdrawal, giving up activities, drinking for a whole day, exceeding previous limits, wanting to cut back or stop drinking). Alcohol problems were reported if participants experienced at least 1 difficulty.¹⁹

Confounding Variables

We selected factors previously associated with onset of alcohol use,^{4,7,8,14,20} collected prospectively, and available for the whole cohort, many of which have not been tested as confounders in other published studies. Adjustments for confounders were undertaken as reported elsewhere for associations between exposure to tobacco use in films and adolescent smoking.²¹

Pre- and postnatal variables measured parental socioeconomic factors, wellbeing and breastfeeding. Antenatal data included housing tenure, maternal characteristics (marital status, age, education, alcohol use during pregnancy, occupation), parity, partner's occupation (representing social class), and financial difficulties. Child gender and date of birth were recorded at delivery or abstracted from other records. Breastfeeding information (exclusive, partial, or never breastfed by 2 months of age) was collected from maternal data when the child was ~6 months old.

The Development and Well-Being Assessment²² assessed childhood disorders at 7 years and included diagnoses for attention-deficit/hyperactive disorder (ADHD), conduct disorder, and anxiety and depression disorders. Further data about child behavior at 13 years were collected by using CASI. Nine items from the intensity seeking scale of Arnett's Inventory of Sensation Seeking²³ were used (the original

item “in general I work better under pressure” was omitted and 2 items related to cinema films were removed [“I stay away from movies said to be frightening or highly suspenseful” and “I like a movie where there are a lot of explosions and car chases”]). The combined sensation seeking scale was derived by adding scores and dividing into quartiles (the top quartile represents highest sensation seeking level).

Data about parental alcohol use were collected when the study children were ~12 years old. Both parents were asked to detail the previous week's alcohol consumption including beers, wines, spirits, fortified wines, and ready-mixed and other alcoholic drinks. They were asked whether such consumption was typical, and binary variables were derived by using median values (≤ 5 vs > 5 U per week for mothers, ≤ 10 vs > 10 U per week for partners).

To quantify parental monitoring, adolescents reported on 9 questions about parental knowledge of their whereabouts, activities, and relationships.^{24,25} Responses were combined to obtain an overall score divided into quartiles (top quartile represents highest level of monitoring).

Mediating Variables

Mediating variables are those that might be on the causal path from exposure to alcohol in movies to individual alcohol use and are therefore not pure confounding variables. At age 15, the CASI asked if the participant smoked every week (yes/no) and how many of their friends drank alcohol during the last year recorded as (a) none, (b) one/some, or (c) most/all friends.^{6,7}

Statistical Analysis

Means and SDs were calculated for normally distributed continuous variables (duration of AUF, age of child at clinic, and maternal age) and proportions for categorical variables

(all others). Associations between AUF and outcomes (alcohol initiation, current alcohol use, binge drinking, and alcohol leading to problems) were assessed by using Poisson regression with robust error variance to estimate risk ratios (RRs) and confidence intervals (CIs).²⁶ The interaction between gender and the exposure variable was formally tested to determine whether separate gender models were required.

Associations between exposure and outcomes were examined after adjustment for confounders: age and gender (model 1); age, gender, and social factors (social class, financial difficulties, housing; model 2); age, gender, and early family influences (maternal characteristics, parity, breastfeeding, parental alcohol intake in pregnancy; model 3); age, gender, and current family influences (current maternal alcohol intake, parental monitoring; model 4); age, gender, social factors, and all family influences (model 5). Two further models were fitted: model 5 plus behavioral factors (ADHD, conduct disorder, anxiety, depression, sensation seeking; model 6); model 6 plus current factors (current smoking, peer alcohol) adjusting for mediators (model 7). Model 5 was repeated adjusting for current partner alcohol intake (excluded in initial models because of missing data [$N = 1380$]). Model 1 was repeated restricting to those with complete confounder data to ensure that changes in estimated RR (models 2–5) were attributable to confounding rather than missing data.

RESULTS

Data on 5509 adolescents were available at 15 years. Alcohol data were available for 5357 and 5175 had data on AUF, providing 5163 with both variables for analysis. Characteristics of the participants are described in Table 1. Mean age was 15.5 years with slightly more girls (53.2%) than boys. The mean (SD)

TABLE 1 Summary of the Characteristics of the 5163 Cohort Members With Alcohol and Film Data Available at Approximately Age 15 y

Time Point	Characteristics	<i>n</i>	Mean	SD
	Cohort member age, y	5163	15.5	0.3
	Maternal age in pregnancy, y	4918	29.2	4.5
		Categories	<i>n</i>	%
8 wk gestation	Housing in pregnancy	Mortgaged	3957	83.0
		Owned	99	2.1
		Council rented	364	7.6
		Private rented	222	4.7
		Other	125	2.6
	Marital status in pregnancy	Married	3944	82.0
	Divorced/separated	216	4.5	
	Widowed	7	0.2	
	Never married	643	13.4	
18 wk gestation	Parity	0	2353	49.4
		1	1649	34.6
		≥2	766	16.1
	Maternal alcohol use in pregnancy	No	1085	27.5
		Yes	2862	72.5
	Partner alcohol use in pregnancy	No	174	3.7
	Yes	4595	96.4	
32 wk gestation	Social class in pregnancy	V	119	2.6
		IV	582	12.7
		III manual	1154	25.2
		III nonmanual	1286	28.0
		II	1248	27.2
		I	197	4.3
	Financial difficulties in pregnancy	Q1 (score 0)	1969	42.3
		Q2 (score 1–2)	1171	25.2
		Q3 (score 3–5)	829	17.8
		Q4 (score 6–15)	686	14.7
		None/CSE	531	11.1
Maternal education	Vocational	362	7.6	
	O levels	1656	34.7	
	A levels	1355	29.4	
	Degree	868	18.2	
Birth	Gender	Boy	2419	46.9
		Girl	2744	53.2
6 mo	Breastfeeding (at 2 mo)	Exclusive	1631	36.1
		Partial	2251	49.8
		Never	641	14.2
7 y	DAWBA at 7.5 y: ADHD disorder	No	72	1.7
		Yes	4211	98.3
	DAWBA at 7.5 y: Conduct disorder	No	107	2.5
		Yes	4176	97.5
	DAWBA at 7.5 y: Anxiety	No	122	2.8
		Yes	4169	97.2
DAWBA at 7.5 y: Depression	No	15	0.4	
	Yes	4276	99.7	
12 y	Maternal alcohol use	≤ 5 U/wk	2203	54.6
		>5 U/wk	1829	45.4
	Partner alcohol use	≤ 10 U/wk	1141	51.1
		>10 U/wk	1090	48.9
13 y	Sensation seeking at 13 y	Q1 (score <17)	1537	33.9
		Q2 (score 17–18)	1027	22.7
		Q3 (score 19–20)	954	21.0
		Q4 (score 21–28)	1017	22.4
15 y	Parental monitoring at 15 y	Q1 (score <31)	1273	28.5
		Q2 (score 32–34)	1199	26.8
		Q3 (score 35–37)	1132	25.3
		Q4 (score 38–45)	866	19.4

duration of AUF was 47.3 (26.8) minutes. The proportion of adolescents who had tried alcohol was 85.7% (CI: 84.7–86.6), 21.2% (CI: 20.1–22.4) currently consumed at least 1 drink a week, 46.6% (CI: 45.2–48.0) were binge drinkers, and 42.6% (CI: 41.2–44.0) had experienced at least 1 drink-related problem.

There was no statistical evidence for interactions between gender and the exposure variable ($P \geq .3$), so analyses were carried out on the whole cohort.

Exposure to Alcohol Depictions and Alcohol Outcomes

Associations between AUF and alcohol outcomes are shown in Tables 2 and 3. For all outcomes, there was an increasing trend across quartiles of exposure (P for trend $<.001$). After adjusting for potential confounders (model 6), there was a 1.2 times increased risk of alcohol onset for the highest exposure and a 2.4-fold increased risk of drinking weekly compared with those least exposed. The risk of binge drinking was 1.7 times higher and that of alcohol-related problems in the previous year doubled. After adjusting for mediators (model 7), risks were increased 1.2-fold (alcohol initiation), 1.8-fold (binge drinking), and 1.7-fold (alcohol-related problems) with a doubled risk for weekly drinking.

Additional Analyses

Model 5 was repeated to adjust for current partner alcohol intake: P for trend remained at $<.001$ with negligible changes in RR per quartile. For alcohol initiation, RR (95% CI) for the highest exposure quartile was 1.3 (1.2–1.4) and for drinking weekly 2.4 (1.7–3.3). For binge drinking and alcohol-related problems, RRs (95% CI) were 1.9 (1.5–2.2) and 2.1 (1.7–2.6), respectively.

We reran model 1 by using complete cases ($N = 2587$) to ensure changes in estimated RR in models 2 to 5 were

TABLE 1 Continued

Time Point	Characteristics	<i>n</i>	Mean	SD
Smoking at 15 y	No	4658	90.3	
	Yes	502	9.7	
Friends drink alcohol at 15 y	None	188	3.7	
	One/some	1495	29.1	
	Most/all	3454	67.2	

CSE, certificate of secondary education; DAWBA, Development and Well-Being Assessment; Q, quartile.

attributable to confounding rather than missing data. The same increasing trend across exposure quartiles was observed with similar effect sizes on alcohol initiation (RR [95% CI] = 1.3 [1.2–1.3]), binge drinking (1.9 [1.7–2.2]), weekly alcohol use (2.4 [2.2–3.5]), and alcohol-related problems (2.1 [1.9–2.6]).

DISCUSSION

Our findings confirm associations between AUFs and alcohol use in UK adolescents, consistent with other studies,^{2–6} even after extensive adjustment for confounders assessed early in the life course. Although our sample revealed less exposure to AUF than adolescents from the United States or Germany (under an hour

compared with ~3 hours elsewhere),^{4,27} those most exposed were ~25% more likely to have tried alcohol, 74% more likely to have binge, and more than twice as likely to be drinking weekly or have had at least 1 alcohol-related problem compared with those least exposed.

Contrary to other studies,^{2,3,10} risk factors such as familial alcohol use, parental monitoring, and sensation seeking did not alter associations between AUF and adolescent alcohol use. This is also contrary to previous work examining associations between film exposure to tobacco use and adolescent cigarette use in this cohort.²¹ However, mediating factors (peer alcohol use and smoking behavior) did attenuate the RR.

This study has several strengths. ALSPAC data are prospective and include a comprehensive set of descriptors associated with adolescent alcohol use. We also used a well-validated measure of AUF¹⁸ and considered the effects of confounding variables from early on in life that have not been used in similar published studies.

There are also limitations. We provided a list of films but only recorded those viewed instead of those seen or unseen. We have no record of how frequently individual films were viewed nor of exposure to alcohol use in other media thus we may underestimate true levels of exposure.²⁷ We do not know whether adolescent alcohol use was sanctioned by parents and we cannot account for the role of parental viewing restrictions.^{4,10,28–30} Data on AUF and alcohol use, peers' alcohol use, and the individual's own smoking behavior were all cross-sectional; therefore, we cannot determine causality. Finally, as with other large cohort studies, ALSPAC is subject to attrition and this may limit the generalizability of our results. However, drop out from ALSPAC is selective with families more likely to be exposed to adverse circumstances

TABLE 2 Associations Between Film Exposure and Alcohol Outcomes

Outcome	Ever Had a Whole Drink			Currently Drink at Least Weekly		
	RR ^a	95% CI	<i>P</i> for trend	RR ^a	95% CI	<i>P</i> for trend
Model 1, min						
28–44	1.2	1.1–1.2	—	1.4	1.2–1.7	—
45–63	1.2	1.2–1.3	—	1.6	1.4–1.9	—
≥64	1.3	1.2–1.3	<.001	2.4	2.0–2.8	<.001
Model 2, min						
28–44	1.2	1.1–1.2	—	1.4	1.2–1.7	—
45–63	1.2	1.2–1.3	—	1.7	1.4–2.0	—
≥64	1.3	1.2–1.3	<.001	2.4	2.0–2.9	<.001
Model 3, min						
28–44	1.2	1.1–1.2	—	1.4	1.2–1.8	—
45–63	1.2	1.2–1.3	—	1.6	1.3–2.0	—
≥64	1.3	1.2–1.3	<.001	2.5	2.1–3.1	<.001
Model 4, min						
28–44	1.2	1.1–1.2	—	1.4	1.1–1.7	—
45–63	1.2	1.1–1.2	—	1.5	1.3–1.9	—
≥64	1.3	1.2–1.3	<.001	2.2	1.8–2.7	<.001
Model 5, min						
28–44	1.2	1.1–1.2	—	1.5	1.2–2.0	—
45–63	1.2	1.1–1.2	—	1.6	1.3–2.1	—
≥64	1.2	1.1–1.3	<.001	2.5	2.0–3.1	<.001
Model 6, min						
28–44	1.2	1.1–1.2	—	1.7	1.3–2.1	—
45–63	1.2	1.1–1.2	—	1.6	1.3–2.1	—
≥64	1.2	1.2–1.3	<.001	2.4	1.9–3.1	<.001
Model 7, min						
28–44	1.1	1.1–1.2	—	1.5	1.2–1.9	—
45–63	1.1	1.1–1.2	—	1.5	1.2–1.9	—
≥64	1.2	1.1–1.2	<.001	2.0	1.6–2.5	<.001

Exposure = Duration of AUFs (vs ≤27 min). Model 1 = age and gender (*N* = 5163). Model 2 = age, gender, and social factors (social class, financial difficulties, housing; *N* = 4482). Model 3 = age, gender, and early family influences (maternal age, maternal education, marital status, parity, maternal alcohol intake in pregnancy, partner alcohol intake in pregnancy, breastfeeding; *N* = 3538). Model 4 = age, gender, social factors and current family influences (current maternal alcohol, parental monitoring; *N* = 3645). Model 5 = age, gender, social factors and all family influences (*N* = 2587). Model 6 = age, gender, social factors, all family influences and behavioral factors (ADHD disorder, conduct disorder, anxiety disorder, depression disorder, sensation seeking; *N* = 2438). Model 7 = age, gender, social factors, all family influences, behavioral factors, and current factors (current smoking, peer alcohol use; *N* = 2431). *N* values for each model are for the outcome “ever had a whole drink.” *N*s may vary slightly for other outcomes.

^a RRs estimated from Poisson regression models with robust error variance.

TABLE 3 Associations between Film Exposure and Adverse Alcohol Outcomes

Outcome	Any Binge Drinking in Last 2 y			Alcohol Leading to at Least 1 Problem in Last 2 y		
	RR ^a	95% CI	<i>P</i> for trend	RR ^a	95% CI	<i>P</i> for trend
Model 1, min						
28–44	1.3	1.2–1.5	—	1.4	1.2–1.5	—
45–63	1.6	1.5–1.8	—	1.7	1.5–1.9	—
≥64	1.9	1.8–2.1	<.001	2.1	1.9–2.3	<.001
Model 2, min						
28–44	1.4	1.2–1.5	—	1.4	1.2–1.6	—
45–63	1.6	1.5–1.8	—	1.7	1.5–1.9	—
≥64	1.9	1.8–2.1	<.001	2.1	1.9–2.4	<.001
Model 3, min						
28–44	1.3	1.1–1.4	—	1.4	1.2–1.6	—
45–63	1.6	1.4–1.8	—	1.7	1.5–1.9	—
≥64	1.9	1.7–2.0	<.001	2.1	1.9–2.4	<.001
Model 4, min						
28–44	1.3	1.7–1.5	—	1.3	1.1–1.5	—
45–63	1.6	1.4–1.8	—	1.5	1.4–1.7	—
≥64	1.9	1.7–2.1	<.001	1.9	1.7–2.2	<.001
Model 5, min						
28–44	1.3	1.1–1.5	—	1.3	1.1–1.6	—
45–63	1.6	1.4–1.8	—	1.6	1.4–1.9	—
≥64	1.8	1.6–2.0	<.001	2.0	1.7–2.3	<.001
Model 6, min						
28–44	1.3	1.1–1.5	—	1.4	1.2–1.7	—
45–63	1.5	1.3–1.7	—	1.6	1.4–1.9	—
≥64	1.7	1.5–2.0	<.001	2.0	1.7–2.4	<.001
Model 7, min						
28–44	1.2	1.0–1.4	—	1.3	1.1–1.5	—
45–63	1.4	1.2–1.6	—	1.5	1.3–1.7	—
≥64	1.5	1.3–1.7	<.001	1.7	1.5–2.0	<.001

Exposure = Duration of AUFs (vs ≤27 min). Model 1 = age and gender (*N* = 5163). Model 2 = age, gender, and social factors (social class, financial difficulties, housing; *N* = 4482). Model 3 = age, gender, and early family influences (maternal age, maternal education, marital status, parity, maternal alcohol intake in pregnancy, partner alcohol intake in pregnancy, breastfeeding; *N* = 3538). Model 4 = age, gender, social factors and current family influences (current maternal alcohol, parental monitoring; *N* = 3645). Model 5 = age, gender, social factors and all family influences (*N* = 2587). Model 6 = age, gender, social factors, all family influences and behavioral factors (ADHD disorder, conduct disorder, anxiety disorder, depression disorder, sensation seeking; *N* = 2438). Model 7 = age, gender, social factors, all family influences, behavioral factors, and current factors (current smoking, peer alcohol use; *N* = 2431). *N* values for each model are for the outcome “ever had a whole drink.” *N*s may vary slightly for other outcomes. —, *P* values are for trend across the risk ratios for each category of exposure (as opposed to separate *P* values for each category compared with the baseline).

^a RRs estimated from Poisson regression models with robust error variance.

more likely to leave the study. Therefore, there may be only marginal effects on regression models, most likely resulting in underestimates of the true correlation.³¹

Our results raise other points of interest. We cannot explain why the potential impact on early alcohol onset is lower than for other alcohol outcomes. The association between film exposure and alcohol onset is weaker in our study than in others: this may be due to differences in methodology or statistical reporting between studies (eg, different

exposures, different outcomes, different effect size statistics), although there may be true differences between countries. Alternatively, as noted elsewhere,^{4,7} the lack of impact of AUF on adolescent alcohol onset may be explained by normative and sanctioned use among adolescents in the United Kingdom. Although it is illegal for someone under 18 to buy alcohol in licensed premises, young people aged 16 or 17 are allowed to drink beer, wine, or cider with a meal in a pub if accompanied by an adult.³² This social sanctioning of adolescent

alcohol use may explain the low impact of AUF on alcohol onset, as many UK adolescents gain personal experience of using alcohol in the above circumstances by age 15. Notably, the normalization of alcohol use has not resulted in low binge-drinking rates among UK adolescents; on the contrary, UK youth have some of the highest binge-drinking rates in Europe.

We are unclear about why confounding factors shown to attenuate the impact of AUF on adolescent alcohol use elsewhere^{4,29,30} have no impact here. Although the legal drinking age and acceptance of adolescent alcohol use in the United Kingdom differ from those in the United States, they are similar to those in Germany. Subtle differences in questions about parental monitoring or knowledge of alcohol use may be responsible as other studies,^{28–30} unlike our own, ask about alcohol use without parental knowledge.

Given the number of studies that reveal an association between AUF and teenage drinking, consideration should be given to what might be done about it. We can envision interventions for families and within film classification processes of the British Board of Film Classification (BBFC) or the Motion Picture Association of America (MPAA). Firstly, it has been demonstrated in multiple prospective studies that adolescents who experience parental restrictions on adult-rated films (eg, BBFC 18 or MPAA R) have less exposure to smoking and drinking in films and lower rates of smoking and drinking themselves.^{2,3,9,10,33–35} Furthermore, these associations are independent of the effect of parenting effectiveness as it is usually measured,⁹ raising the possibility that motivating and assisting parents to implement media restrictions between late childhood and early adolescence could have a positive impact on early-onset use of multiple

substances. Such interventions should be developed and tested in randomized trials. Secondly, because it is also clear from recent studies that films with adult ratings have fewer child and adolescent viewers, film boards like the BBFC and MPAA could influence exposure by applying adult ratings for all films that portray alcohol use. This is justified because movie rating systems exist to protect children from seeing media that may adversely affect their behavior.

Adverse outcomes from alcohol use are a large societal public health problem, and rating films according to alcohol content may reduce problem-related alcohol use and associated harm in young people. As fully explained in recent publications by the National Cancer Institute³⁶ and World Health Organization,³⁷ film producers negotiate the film rating with directors before shooting. An adult rating for alcohol use would therefore result in the removal of alcohol use from films intended for the adolescent market and also reduce adolescent exposure via adult-rated films.

CONCLUSIONS

We found an association between AUF and drinking among UK youth, consistent with other studies of United States and other EU countries. This suggests that the findings in this literature are robust and should be acted upon. Given the almost universal exposure to AUF reported here and associations with adolescent alcohol use, bingeing, and alcohol-related problems, it would be prudent for researchers to develop family level media restriction interventions aimed at children and early adolescents, and for film ratings boards to restrict films with alcohol depictions to adult categories, as they currently do for extreme violence.

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