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ARTICLE

Longitudinal Study of Exposure to Entertainment Media and Alcohol Use Among German Adolescents

Reiner Hanewinkel, PhD[a], James D. Sargent, MD[b]

[a]IFT-Nord, Institute for Therapy and Health Research, Kiel, Germany; [b]Cancer Control Research Program, Norris Cotton Cancer Center, Dartmouth Medical School, Lebanon, New Hampshire

What's Known on This Subject	**What This Study Adds**
Few longitudinal studies have examined the relationship between entertainment media and adolescent alcohol use yet adolescents sustain high exposure levels to depictions of alcohol use in television viewing and movies.	This study extends findings from a longitudinal study of US teenagers, showing that exposure to movie alcohol use predicts alcohol onset and binge drinking. Having a television in the bedroom also predicted alcohol use but not time spent watching television.

ABSTRACT

BACKGROUND. Entertainment media exposure may predict teenager alcohol use, but few longitudinal studies have been reported.

METHODS. A longitudinal study was conducted of 2708 German adolescents aged 10 to 16 years who had never drunk alcohol. Each adolescent was surveyed at school about daily television use, whether they had a television in their bedroom, and their exposure to movie alcohol depictions. Adolescents were resurveyed 12 to 13 months later (retention rate: 85%) to determine onset of drinking alcohol without parental knowledge and binge drinking ($\geq$5 consecutive drinks).

RESULTS. Overall, 885 (33%) students initiated alcohol use without parental knowledge (17% in quartile 1 movie alcohol exposure), and 387 (14%) initiated binge drinking during follow-up. After controlling for baseline covariates, exposure to movie alcohol use significantly increased percent initiating alcohol use (to 24% in exposure quartile 2, 33% in quartile 3 and 34% in quartile 4) and percent initiating binge drinking (to 8.6% in exposure quartile 2, 12% in quartile 3 and 13% in quartile 4). Having a television in the bedroom also predicted both outcomes, but daily television use did not.

CONCLUSIONS. Movie exposure and having a television in the bedroom are both independent predictors of onset of problematic alcohol use among German teenagers. Media restrictions could play a role in prevention. *Pediatrics* 2009; 123:989–995

ALCOHOL USE IS a global health problem,[1,2] affecting adolescents in part through its association with intentional and unintentional injuries. Understanding why adolescents begin to drink alcohol, and why they escalate in drinking and develop alcohol-related problems, is key to preventing morbidity and mortality associated with problematic alcohol use.

A number of studies have examined the role that entertainment media plays in the onset of alcohol use, but little of that research is longitudinal.[3] Two studies found a relationship between hours of television/music video viewing and initiation of alcohol use, 1 in Dutch adolescents[4] and 1 in US adolescents.[5] Neither study controlled for peer or parent alcohol use; thus, confounding by these important social influences could have nullified a somewhat weak television effect. A third study found a relationship between exposure to movie alcohol depictions and subsequent drinking among US adolescents, but that study did not control for parent use of alcohol.[6] Furthermore, the television studies did not assess exposure to movie alcohol depictions, and the movie study did not control for television viewing.

The present study examines exposure to movie alcohol use and television viewing in a longitudinal sample of German adolescents, for whom a cross-sectional study has been published.[7] This study examines the relationship between exposure to entertainment media and the onset of drinking, building on methods employed in a previous study of US adolescents.[6] This study also extends the work by assessing the cross-cultural influence of movies, by incorporating an assessment of binge drinking, and by controlling for important covariates that were missing from previous studies.

METHODS

Participants

Letters inviting participation were sent to 42 randomly selected secondary schools in Schleswig-Holstein (a bundesland [state] of Germany), of which 27 agreed to participate. The baseline assessment was described in detail elsewhere.[7] In October and November of 2005 (and 12–13 months later in 2006) trained research staff administered a confidential survey where 85% of all fifth through ninth-grade students attending the schools were surveyed ($n = 5581$). Follow-up surveys were completed in 2926 (85%) of 3432 baseline "never drinkers." After excluding 218 surveys for missing data, the final sample consisted of 2708 adolescents. Participants lost to follow-up were significantly older, male, higher on sensation seeking/rebelliousness, had higher exposure to all media variables, were more often from lower socioeconomic status (SES) schools, reported lower school performance, and had more friends who drank alcohol.

Survey Measures

Because parent-sanctioned alcohol use is common in German households, we assessed initiation of alcohol use outside the family context and alcohol misuse, determined through the question, "Have you ever drunk alcohol that your parents did not know about?" (yes, no). Binge drinking was assessed through the question, "Have you ever had 5 or more drinks of alcohol in a row, that is, within a couple of hours?" (yes, no). Drinks of alcohol were defined as follows: "By alcohol we mean beer, wine, alcopops, bowle, and other alcohol beverages like vodka or rum." Data on a number of covariates that could confound the relationship between exposure to alcohol use in media and teenager drinking were also collected, including (see Appendix): type of school (a proxy for SES); age; gender; school performance ("How would you describe your grades last year?" [excellent, good, average, below average]); rebelliousness/sensation-seeking;[8,9] and parenting style, based on combining 2 domains from the authoritative parenting construct.[10,11] Peer alcohol use was assessed with the question, "How many of your friends drink alcohol" (none, some, most, all), and parent alcohol use with the question, "Which of the following statements best describes how often your parents drink alcohol?" (never, once a year, once a month, once a week, every day).

Exposure Measurement

Exposure to television was assessed through 3 questions, 2 measuring frequency of use: "Think about weekends: How many hours a day do you watch television, DVDs, or videos in your leisure time?" (none, half an hour, 1 hour, 2 hours, 3 hours, 4 hours, more than 4 hours); "Think about weekdays: How many hours a day do you watch television, DVDs, or videos in your leisure time?" (none, half an hour, 1 hour, 2 hours, 3 hours, 4 hours, more than 4 hours); and 1 that measured access, "Do you have television in your own room?" The 2 fre-

quency measures were combined into a scale to assess time spent watching television (Cronbach's $\alpha = .79$). Previously validated methods[12] were used to measure exposure to movie alcohol use. Movies chosen for this study included all internationally distributed movies from the top 25 German box office hits every year from 1994 to 2001 ($n = 172$) and from the top 100 German box office hits per year from 2002 to 2004 ($n = 226$). Internationally distributed movies dominate the German market; this sample represents 80% of the German box office hits in these years. Of the total 398 movies, 388 (97%) were produced and/or distributed internationally by American companies (Hollywood studios), comprising the majority of box office hits in the German film market.[13]

Each movie was content-coded for alcohol use, defined as real or implied use of an alcoholic beverage by any character in the film, including purchasing alcohol, or occasions where alcohol is clearly in the possession of a character (eg, characters sitting at dinner with filled wine glasses), but actual alcohol use was not shown. Empty alcoholic beverage containers (bottles, glasses, etc) and alcohol containers that were displayed but were not implied as being consumed by a character (eg, in stores, drinking establishments) were not counted as alcohol use. All alcohol use and implied use was timed in seconds from the moment the alcohol appeared on screen. A randomly selected subset of 10% of movies was double-coded to allow for assessment of interrater reliability. Concordance between coders was based on agreement of onscreen alcohol use at 1-second intervals, and the mean κ value was 0.86 (SD: 0.17) indicating good coding reliability.

Adolescents' exposure to these movies was assessed by asking whether the respondent had ever seen each of a unique set of 50 film titles, randomly selected from the pool of 398 movies and stratified by the Motion Picture Association of America rating to reflect the same distribution of ratings: 32% R, 44% PG-13, 16% PG, and 7% G. On average, each movie title was included in 705 questionnaires (SD: 26). To estimate exposure to alcohol use in popular contemporary movies overall in this sample, we divided minutes of alcohol use in movies seen by the respondent by the total minutes of movie alcohol use the adolescent would have been exposed to had he/she seen all 50 movies. That proportion was then multiplied by 18.02, the total hours of alcohol exposure from all 398 movies to produce an estimate of exposure to alcohol use in hours.

Statistical Analysis

Generalized linear models[14] were used to assess drinking initiation without parental knowledge and binge drinking as a function of both movie exposure and baseline covariates. Analyses were performed by using Stata 10.0 (Stata Corp, College Station, TX). We used a log link, rather than a logistic regression, so that relative risks could be estimated directly. The analysis adjusted standard errors for clustering at the school level, but the intraclass correlation for drinking was small (0.04, dropping to 0.006 once school SES was taken into account).

TABLE 1 Covariates and Their Relationship to Movie Alcohol Exposure

Categorical Variables	Movie Alcohol Exposure Quartile			
	1, n (Column %)	2, n (Column %)	3, n (Column %)	4, n (Column %)
No. of students	677 (25)	677 (25)	677 (25)	677 (25)
Age, y				
10–11	209 (31)	158 (24)	125 (18)	71 (11)
12	266 (39)	245 (36)	232 (34)	214 (32)
13	130 (19)	178 (26)	213 (32)	223 (32)
14–16	72 (11)	96 (14)	107 (16)	169 (25)
Gender				
Female	402 (59)	339 (50)	342 (50)	326 (48)
Male	275 (41)	338 (50)	335 (50)	351 (52)
School type				
Gymnasium (SES = mid to high)	359 (53)	343 (51)	302 (45)	268 (40)
Realschule (SES = mid)	138 (20)	144 (21)	151 (22)	143 (21)
Gesamtschule (SES = mixed)[a]	66 (10)	53 (8)	63 (9)	41 (6)
Hauptschule (SES = low)	114 (17)	137 (20)	161 (24)	225 (33)
Parent drinking pattern				
Never	74 (11)	72 (11)	73 (11)	75 (11)
Once a year	122 (18)	137 (20)	119 (18)	145 (22)
Once a month	257 (38)	239 (35)	240 (35)	223 (33)
Once a week	184 (27)	203 (30)	207 (30)	205 (30)
Every day	40 (6)	26 (4)	38 (6)	29 (4)
Friend drinking				
None	558 (82)	517 (76)	470 (69)	391 (58)
Some	113 (17)	148 (22)	189 (28)	257 (38)
Most/all	6 (1)	12 (2)	18 (3)	29 (4)
School performance				
Excellent	110 (16)	93 (14)	49 (7)	65 (10)
Good	328 (49)	325 (48)	316 (47)	295 (43)
Average/poor	239 (35)	259 (38)	312 (46)	317 (47)
Television in bedroom				
None	451 (67)	352 (52)	292 (43)	231 (34)
Has television in bedroom	226 (33)	325 (48)	385 (57)	446 (66)
Continuous variables	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Television time[b]	0.43 (0.20)	0.49 (0.20)	0.52 (0.20)	0.58 (0.20)
Sensation seeking/rebelliousness[b]	0.45 (0.30)	0.55 (0.33)	0.61 (0.32)	0.71 (0.37)
Parenting style[b]	2.31 (0.41)	2.24 (0.41)	2.20 (0.41)	2.14 (0.43)

[a] Gesamtschule is an experimental school category. In Gesamtschule schools, there is a mix of pupils from the other 3 types of schools, so these schools tend to have an equal proportion of pupils from the "Gymnasium," the "Realschule," and the "Hauptschule" school populations.

[b] Overall means: time spent watching television, 0.51 (SD: 0.21 [range: 0–1]); sensation seeking/rebelliousness, 0.58 (SD: 0.34 [range: 0–2.25]); parenting style, 2.22 (SD: 0.42 [range: 0.4–3]).

Lowess (locally weighted scatter plot) smoothed methods were used to graphically represent the relationship between exposure to movie alcohol use and adolescent drinking initiation without parental knowledge and binge drinking initiation. To test for linearity in the dose-response curves, we entered movie alcohol exposure as a continuous variable together with a quadratic term, for which statistical significance was used as evidence of nonlinearity. For the multivariate regression analyses, exposure to alcohol use in movies was classified into population quartiles by using median and interquartile range as follows: 0 to 0.99 hours for the first quartile, 1.00 to 2.40 hours for the second quartile, 2.41 to 4.59 hours for the third quartile, and 4.60 to 18.02 hours for the fourth quartile. All reported P values were 2-sided, and $P < .05$ was considered statistically significant.

RESULTS

The final sample of 2708 adolescents had a mean age at baseline of 12.4 years (SD: 1.05). Table 1 shows covariates and their relationship to movie alcohol exposure at baseline. Movie alcohol exposure was significantly higher for adolescents who had higher age, lower SES, more friends who drank, poorer school performance, a television in the bedroom, higher television viewing time, higher sensation seeking/rebelliousness scores, and whose parents had less effective parenting style. The relationship between age and exposure was particularly strong; whereas 31% of the adolescents in the lowest quartile of exposure were aged 10 to 11, only 11% of those in the highest quartile of exposure were in that age category. Having a television in the bedroom was also a strong predictor of exposure; whereas 33% of adolescents in the lowest quartile of exposure had a television
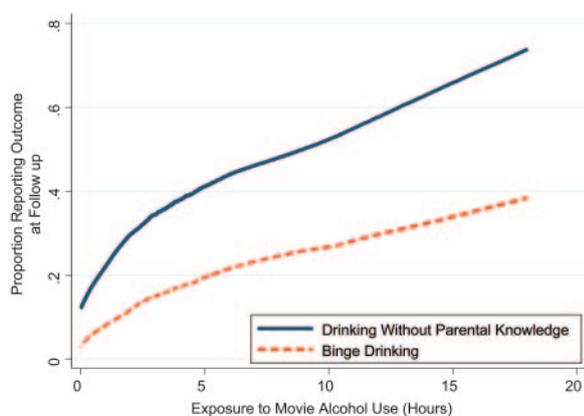
FIGURE 1

Exposure to alcohol use in movies and alcohol use initiation.

in the bedroom, some 66% of those in the highest exposure quartile were in that category. Among continuous variables, the strongest associations were with television time and sensation seeking/rebelliousness, where the means were approximately 1 SD higher in the highest versus lowest quartile. To account for these differences, we adjusted for these variables in the multivariate analysis. Exposure to movie alcohol was not associated with gender or parent-drinking pattern.

Overall, 87.6% of movies in this sample depicted some alcohol use. For the movie sample, median screen time for movie alcohol use was 1.86 minutes (interquartile range: 0.48, 3.73 minutes). Adolescents were exposed to an estimated mean movie alcohol exposure of 3.2 (SD: 2.9) hours from the 398 movies. Some 885 (33%) of participants initiated drinking without parental knowledge during the follow-up period, and 387 (14%) initiated binge drinking.

We first show the relationship between exposure to movie alcohol, treated as a continuous variable, and adolescent alcohol use. The dose-response curves for trying drinking and binge drinking as a function of movie alcohol exposure are shown in Fig 1. The curves are similar to previously published dose-response curves for US adolescents,[6] with the response appearing non-linear, and with a stronger response for adolescents in the lower range of exposure. This is illustrated by the higher steepness of the curve for low-exposure adolescents. When movie alcohol exposure was entered as a continuous variable in a generalized linear model, the quadratic term was statistically significant for both tried drinking and binge drinking models.

For the multivariate analysis, exposure to movie alcohol was divided into 4 quartiles of exposure. Trying drinking without parental knowledge was significantly associated with increased exposure to movie alcohol use; whereas only 17% of adolescents in quartile 1 tried drinking, 27% tried in quartile 2, 41% tried in quartile 3, and 47% tried in quartile 4 ($P < .0001$). Binge drinking was also significantly associated with the exposure; whereas only 6% of adolescents in quartile 1 had tried binge drinking, 10% tried in quartile 2, 17% tried in quartile 3, and 24% tried in quartile 4 ($P < .0001$).

Table 2 shows the crude and adjusted association between movie alcohol exposure (and covariates) and both drinking outcomes. In the crude analysis, only gender and school SES were not associated with trying drinking without parental knowledge, and only school SES was not associated with binge drinking. Exposure to movie alcohol use remained a significant predictor of adolescent drinking in the multivariate analysis, with the adjusted relative risks ranging from 1.42 to 2.00 comparing quartiles 2 and 4, respectively, with quartile 1 for drinking without parental knowledge and 1.44 to 2.23 for binge drinking (Table 2). Based on the percent reporting trying drinking in quartile 1 (17%), the relative risks imply that higher movie alcohol exposure in quartiles 2, 3, and 4 was associated with drinking rates of 24%, 33%, and 34% respectively. Adolescent drinking without parental knowledge was also significantly associated with having a television in the bedroom, age, parent and friend alcohol use, and sensation seeking/rebelliousness; there was no multivariate association with gender, school type (measure of SES), school performance, or parenting style. Binge drinking was also significantly associated with movie alcohol exposure; based on the percent reporting binge drinking in quartile 1 (6%), the relative risks reported in Table 2 imply that higher movie alcohol exposure in quartiles 2, 3, and 4 was associated with binge drinking rates of 8.6%, 12%, and 13% respectively. Binge drinking was also associated with age, parent and friend drinking pattern, and sensation seeking/rebelliousness. The response pattern across quartiles confirmed that the largest media effect was for the lower-exposed adolescents. For example, for drinking without parental knowledge, increasing exposure from quartile 2 to quartile 3 raised the adjusted relative risk from 1.42 to 1.94, but increasing exposure from quartile 3 to quartile 4 raised the adjusted relative risk only from 1.94 to 2.0. Another observation is that controlling for confounding had a larger effect on the estimate for high-exposure adolescents. For binge drinking, adding controls dropped the crude estimate for quartile 2 on binge drinking from 1.82 to 1.44; for quartile 4, the estimate dropped from 4.34 to 2.23. Comparing the strength of the association, being in quartile 4 of exposure gave an adjusted relative risk of binge drinking (2.23) comparable with the adjusted relative risk associated with having most/all friends drink (a condition reported by only ~3% of adolescents) or having parents drink every day (a condition reported by only ~5% of adolescents). Having a television in the bedroom had only a weak effect on trying alcohol (adjusted relative risk: 1.08) that barely reached statistical significance, and a somewhat stronger effect on binge drinking (adjusted relative risk: 1.60).

DISCUSSION

This study documents levels of exposure to actors using alcohol in movies that run in the hours, with exposed never-drinker adolescents having a substantially higher risk of trying drinking and binge drinking in the future. The findings suggest that the exposure not only precedes the onset of the behavior but is independent of a number

TABLE 2 Crude and Adjusted Relative Risks for Trying Alcohol During the Observation Period

Categorical Variables	Drinking Without Parental Knowledge				Binge Drinking			
	Crude RR	Adjusted RR	Lower 95% CL	Upper 95% CL	Crude RR	Adjusted RR	Lower 95% CL	Upper 95% CL
Alcohol use seen in movies								
Quartile 1	1.00	1.00	—	—	1.00	1.00	—	—
Quartile 2	1.60	1.42	1.16	1.74	1.82	1.44	0.96	2.17
Quartile 3	2.40	1.94	1.65	2.28	3.03	1.95	1.27	3.00
Quartile 4	2.76	2.00	1.69	2.37	4.34	2.23	1.48	3.37
Television in bedroom								
None	1.00	1.00	—	—	1.00	1.00	—	—
Has television in bedroom	1.29	1.08	1.00	1.16	2.11	1.60	1.31	1.96
Gender								
Male	1.00	1.00	—	—	1.00	1.00	—	—
Female	0.92	1.03	0.92	1.16	0.74	0.91	0.72	1.15
Age, y								
10–11	1.00	1.00	—	—	1.00	1.00	—	—
12	1.44	1.27	1.05	1.54	1.78	1.45	0.98	2.15
13	2.00	1.52	1.18	1.95	3.64	2.38	1.60	3.53
14–16	1.86	1.40	1.06	1.84	4.62	2.80	1.87	4.20
School type								
Gymnasium (SES = mid to high)	1.00	1.00	—	—	1.00	1.00	—	—
Realschule (SES = mid)	1.18	1.02	0.79	1.33	1.29	1.05	0.84	1.32
Gesamtschule (SES = mixed)	1.17	1.13	0.93	1.37	0.77	0.76	0.62	0.93
Hauptschule (SES = low)	1.01	0.83	0.66	1.05	1.28	0.84	0.62	1.13
Parent drinking pattern								
Never	1.00	1.00	—	—	1.00	1.00	—	—
Once per year	1.56	1.48	1.14	1.91	1.44	1.36	0.90	2.07
Once per month	1.62	1.56	1.17	2.08	1.42	1.52	1.00	2.31
Once per week	1.72	1.51	1.18	1.95	1.88	1.78	1.15	2.75
Every day	1.70	1.57	1.18	2.08	2.29	2.47	1.49	4.10
Friend drinking								
None	1.00	1.00	—	—	1.00	1.00	—	—
Some	1.75	1.29	1.18	1.42	2.62	1.53	1.25	1.88
Most/all	2.19	1.50	1.20	1.88	4.72	2.34	1.72	3.17
School performance								
Excellent	1.00	1.00	—	—	1.00	1.00	—	—
Good	1.23	1.02	0.90	1.16	1.12	0.88	0.66	1.17
Average/poor	1.62	1.16	1.02	1.32	1.98	1.20	0.91	1.58
Continuous variables								
Television time[a]	2.07	0.99	0.75	1.31	3.15	0.76	0.48	1.19
Sensation seeking/rebelliousness[a]	2.40	1.71	1.45	2.02	3.60	2.13	1.69	2.68
Parenting style[a]	0.66	0.88	0.77	1.01	0.58	0.95	0.74	1.21

RR indicates relative risk; CL, confidence limit.

[a] Overall means: time spent watching television, 0.51 (SD: 0.21 [range: 0–1]); sensation seeking/rebelliousness, 0.58 (SD: 0.34 [range: 0–2.25]); parenting style, 2.22 (SD: 0.42 [range: 0.4–3]).

of social influence and personality confounders. Notably, the finding of a movie effect in Germany occurs in the cultural context of lenience toward teenager alcohol consumption, where teenagers are exposed to multiple other individual and societal prompts to drink: high per capita consumption of alcohol, little restriction on alcohol advertising, low alcohol pricing, and legal consumption of alcohol at age 16.

The crude dose-response curves show that the response is greatest for relatively low-exposure adolescents. Addition of covariate controls accentuates this effect, because the attenuation (reduction in effect size from crude to adjusted relative risk) is larger for the highly exposed adolescents, further reducing the effect of incrementally higher doses in this group. This is because risk factors for substance use tend to cluster among the high-exposure adolescents who are at risk for substance use for many reasons besides their excessive media exposure. The story is different with low-exposure adolescents; they have the largest crude response to movie drinking. One possible explanation for this is a ceiling-to-the-movie effect, such that once you reach a certain point, additional exposure has only a small effect. Another possibility is a negative-interaction effect, something we did not explore in this analysis. In addition, controlling for confounding has only a small effect on the estimates for low-exposed adolescents, suggesting that unmeasured confounding is not a big concern, especially in this area of the exposure curve. This fact also suggests that interventions that target relatively low-risk adolescents may have the greatest chance of success.

Strengths of the study include the large sample, lon-

gitudinal design, use of a well-validated measure of movie alcohol exposure, covariate control for other social influences, personality and parenting style, and finding an association between exposure to the same movies (97% of the movie titles in this sample were produced and distributed by Hollywood studios) across cultures,[6] underlining the external validity of the finding. The present study controlled for covariates that were missing from the US study, parent alcohol use and television watching, adding confidence in the independence of the association. This study also explored the effect of television exposure, finding no relation between hours of television exposure and teenager drinking, and contrasting with 2 previously published longitudinal studies, 1 in the United States,[5] and 1 in the Netherlands.[4] It should be noted that neither previous study assessed movie exposure, and neither controlled for parent or peer drinking, personality (sensation seeking), or parenting style, making the television-exposure finding suspect in those studies. Having a television in the bedroom has been shown to independently predict smoking, over and above movie exposure, in 1 US study;[15] we suggest that having a television in the bedroom may be associated with less parental monitoring of media use and more frequent viewing of adult media venues, which tend to contain more smoking and drinking.

The present study is subject to limitations inherent in any observational study. Measurement error could account for the lack of a finding for television viewing, which was not measured for content in the same way movie exposure was. More studies need to be performed to determine the relative importance of different media venues in predicting alcohol use. Although no observational study can rule out unmeasured confounding, the introduction of multiple covariate domains and the finding of a stronger dose-response in the lower-exposure (lower risk) adolescents lessens concern about this problem. Higher-risk adolescents were more likely to be lost to follow-up, so our findings about adolescents with higher exposure levels are less certain.

CONCLUSIONS
Evidence is accumulating that exposure to movie alcohol depictions predicts problematic alcohol use during adolescence. Alcohol use permeates movies, and adolescents are exposed to hours of such depictions during the course of their normal viewing routines. Pediatricians and other health care practitioners should stress the importance of prudent media management for parents of young children. Rules could include a limit on the number of movies teenagers are allowed to watch and enforced restrictions on viewing movies rated for older adolescents and adults. It has been shown, that adolescents who report less parental restriction from watching these types of movies have a higher risk of engaging in binge drinking.[16] These parenting interventions are probably as important in limiting substance use as setting rules about how long the adolescent can stay out at night.

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APPENDIX Covariates and Their Assessment

Variable	Survey Question	Response Categories
Sociodemographics		
Age	How old are you?	[lowem][lowem]years
Gender	Are you a girl or a boy?	Girl/boy
SES	Assessed by type of school attended	
Social influences		
Parental alcohol use	Which of the following statements best describes how often your parents drink alcohol?	Never, once a year, once a month, once a week, every day
Friend drinking	How many of your friends drink alcohol?	None, some, most, all
Adolescent characteristics		
School performance	How would you describe your grades last year?	Excellent, good, average, below average
Sensation seeking/rebelliousness (12-item index, range: 0–3, Cronbach's $\alpha = .77$)	I like to do scary things	Not like me
	I get bored being with the same	Sort of like me
	friends all the time	A lot like me
	I like to do dangerous things	Just like me
	I often think there is nothing to do	
	I like to listen to loud music	
	I get in trouble in school	
	I argue a lot with other kids	
	I do things my parents wouldn't want me to do	
	I do what my teachers tell me to do	
	I sometimes take things that don't belong to me	
	I argue with my teachers	
	I like to break the rules	
Parenting style[16] (8-item index, range: 0–3, Cronbach's $\alpha = .64$)	She makes me feel better when I am upset	Not like her
	She listens to what I have to say	Sort of like her
	She is too busy to talk to me	A lot like her
	She wants to hear about my problems	Just like her
	She has rules that I must follow	
	She tells me what time I have to be home	
	She asks me what I do with my friends	
	She knows where I am after school	

SES was not measured directly. Instead, school type was used as a proxy. Schleswig-Holstein has a school system with 4 types of schools, and type of school is strongly associated with SES. The Hauptschule recruits pupils from low SES, the Realschule recruits students with mid SES, the Gymnasium pupils have a mid to high SES background, and the Gesamtschule is a mixed form.

Longitudinal Study of Exposure to Entertainment Media and Alcohol Use Among German Adolescents

Reiner Hanewinkel and James D. Sargent

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