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Exposure to Smoking in Popular Contemporary Movies and Youth Smoking in Germany

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Abstract

Background— Studies have linked exposure to movie smoking and smoking initiation among U.S. adolescents, but there has been only one published study of adolescents outside the U.S.

Method— Cross sectional survey of 5586 schoolchildren aged 10–17 with a mean of 12.8 (SD=1.2) years from randomly selected secondary schools in Schleswig-Holstein, Germany, in October/November 2005. In August 2006, using previously validated methods, exposure to movie smoking was estimated from 398 internationally distributed films (98% produced and distributed by U.S. studios) released in Germany, and examined its relation with ever and current (30 day) smoking.

Results— Overall, 40.7% of the sample had tried smoking, and 12.3% were current smokers. The sample quartile (Q) of movie smoking exposure was significantly associated with the prevalence of smoking initiation: 0.17 of adolescents in Q1 had tried smoking; 0.35 in Q2; 0.47 in Q3; and 0.64 in Q4. Movie smoking exposure was significantly associated with the prevalence of current smoking: 0.03 for adolescents in Q1; 0.08 in Q2; 0.14 in Q3; and 0.25 in Q4. After controlling for sociodemographics, parent/friend/sibling smoking, school performance, personality characteristics, TV consumption, receptivity to tobacco marketing and parenting style, the adjusted odds ratios for having tried smoking were 1.7 (95% confidence interval [CI]: 1.4, 2.1) for Q2, 1.8 (95% CI: 1.5, 2.3) for Q3, and 2.2 (95% CI: 1.8, 2.8) for Q4 compared with adolescents in Q1. The adjusted odds ratios for current smoking were 1.4 (95% CI: 0.9, 2.2) for Q2, 1.7 (95% CI: 1.1, 2.6) for Q3, and 2.0 (95% CI: 1.3, 3.1) for Q4 compared with adolescents in Q1.

Conclusions— Smoking in internationally distributed movies is associated with ever and current smoking among German adolescents. This suggests the need for prospective studies of this association in countries other than the U.S. and research into the potential impact of countrywide policies that would limit exposure of young adolescents to movie smoking.

INTRODUCTION

Despite recent prevalence declines in many countries, smoking remains the single greatest preventable cause of mortality, and will be responsible for over a billion deaths worldwide if current patterns of smoking continue.^{1,2} One way of controlling the smoking epidemic is to prevent youth from taking up the behavior. Adolescents initiate smoking for social reasons,³ and the social risk factors include influences such as parent^{4–7} and friend smoking.^{7, 8}

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Tobacco marketing is also linked with youth smoking,⁹ and this serves as the basis for controls on smoking marketing contained in the WHO Framework Convention on Tobacco Control, in which Article 13 recognizes that a comprehensive ban on tobacco marketing would reduce consumption. However, a comprehensive ban on tobacco marketing would not limit other mass media venues from projecting favorable images of smoking, such as smoking contained in motion pictures, increasingly recognized as an important contributor to the smoking epidemic.¹⁰

Much of the research linking exposure to smoking to movies with adolescent smoking comes from studies of U.S. children and their exposure to smoking in Hollywood movies. Cross-sectional^{11–13} and longitudinal¹⁴ studies have assessed such exposure and have found a strong, independent association with smoking onset. Other studies in U.S. adolescents have linked smoking onset with smoking status of the adolescent's favorite Hollywood star.¹⁵ However, Hollywood movies are distributed world wide, with over half of the box office dollars coming from outside the U.S.¹⁶ Indeed, Goldberg¹⁷ showed a bivariate relation between number of Hollywood movies seen in the past month and smoking among Hong Kong teens; however, this study did not control for covariates. It is important to assess other samples in order to understand the reach and impact of Hollywood movies beyond the U.S. domestic teen audience. It is possible that smoking in Hollywood movies is particularly salient for American adolescents and not as impactful for adolescents outside that culture. On the other hand, given the pervasiveness and attractiveness of American consumer culture,¹⁸ it is possible that these movies have even more impact outside the U.S.

This study reports results of a cross-sectional survey of young German adolescents, with the assessment of movie smoking using lists of movie titles, similar to methodology employed in some of the U.S. studies.¹² The aim is to assess exposure to smoking from popular contemporary, internationally distributed films released in the German market and to determine if such exposure is linked with youth smoking. Children in Germany are socialized to view tobacco use as normative, in part because tobacco control policies there are weak,¹⁹ often attributed to the persuasive influence of the Tobacco Industry on German Government.^{20, 21} For example, whereas there are now complete workplace smoking bans in over 10 states and thousands of communities in the United States, and several countries in Europe, Germany has yet to ban indoor smoking anywhere, indeed, several of the Bundesländer (German States) allow adolescents to smoke in school yards. In addition, whereas the Master Settlement Agreement in the United States bans many forms of advertising, including billboards, and limits branded merchandise distribution, Germany has neither a ban on outdoor, point of sale, and cinema advertising, nor any limits on indirect advertisements and sponsorship. Furthermore, Germany has probably the highest per capita concentration of cigarette vending machines in the world, making cigarettes easily available to children and adolescents.²² Thus German adolescents sustain much higher exposure to other social influences to smoker, the potential confounders of the movie smoking relationship. These other factors influence cognitions and attitudes toward smoking, competing with the influence of movie smoking. They compete with movie smoking directly as confounders, and also because some of them interact negatively with movie smoking. For example, it has been shown that the presence of family smoking makes movie smoking less influential.¹⁴ Because of high exposure to alternative social influences, Germany provides a rigorous testing ground for confirmation of the relationship between youth smoking and smoking in movies.

METHODS

Sample Selection

In September 2005, letters were sent to 42 randomly selected secondary schools in Schleswig-Holstein, a Bundesland (State) of Germany (figure 1). Twenty seven (64%) schools agreed to

participate. Schleswig-Holstein has a school system with four types of schools, and type of school is strongly associated with socioeconomic status (SES).²³ The “Hauptschule” schools recruit pupils from low SES backgrounds, the “Realschule” schools recruit students from middle class families, the “Gymnasium” schools serve middle and upper class students, and the “Gesamtschule” serves students with a mix of SES backgrounds. In October/November 2005, trained research staff administered the confidential survey during class time. Parental written permission and student assent were required for participation in the survey. The study was approved by the Ministry of Cultural Affairs of the Bundesland Schleswig-Holstein. The survey captured about 85% of students attending the schools; 836 (12.7%) were disqualified because parents gave no written permission for student participation, and 145 (2.5%) students were absent the day of the survey. Finally, 40 surveys (0.7%) were excluded for missing or inconsistent responses on smoking status.

Outcome Measures

Ever tried smoking was determined by asking the question “How many cigarettes have you smoked in your life?” The response “none” was categorized “never smoked” and all other responses (just a few puffs, 1–19 cigarettes, 20–100 cigarettes, >100 cigarettes) as “tried smoking”.²⁴

Current smoking was assessed by asking “How often do you smoke at present?” To which respondents could answer “I don’t smoke”, “less than once a month”, “at least once a month, but not weekly”, “at least once a week, but not daily”, or “every day”. Those who reported smoking at least monthly are defined as current smokers. Studies of the validity of responses to smoking queries in school settings have shown that students respond honestly if they are assured of confidentiality of their responses,²⁵ and steps were taken to assure confidentiality. The survey was anonymous; the questionnaires were distributed by the research staff; teachers were instructed to sit in front of the class, so that they were not able to see the answers of the pupils; and the questionnaires were collected by the research staff, placed in an envelope and sealed in front of the class.

Exposure Measurement

Adolescents’ exposure to smoking in movies was assessed by asking each student to indicate which film he or she had seen from a unique list of 50 movies. A list of 50 movies was randomly selected for each individual survey from a sample of 398 popular contemporary movies released between 1994 and 2004 in German cinemas; the time period extending eleven years back from the survey and the use of the top 25 box office hits was done to ensure a sample frame similar in scope to that used in a previous study of U.S. adolescents.¹² The 398 movies included all internationally distributed movies from the top 25 German box-office hits every year from 1994 to 2001 (n=172) and the top 100 German box office hits per year from 2002 to 2004 (n=226). This represents 80% of the German box office hits in these years (86% of the top 25 movies of the years 1994–2001, and 75% of the top 100 movies of the years 2002–2004). The majority (388) of the 398 movies (98%) were produced and/or distributed internationally by American companies. Few independent studios distribute overseas using their own distribution network. Instead, the movies are distributed mainly by the major studio corporations represented by the Motion Picture Association of America. These Hollywood studios either produced or distributed the majority of box office hits in the German film market.

Movie smoking is associated with Motion Picture Association of America (MPAA) film rating. To minimize subject-to-subject disparities in potential exposure to movie smoking, selection of movies was stratified so that each randomly generated list of 50 movie titles had the same distribution of MPAA rating as the larger sample of top box-office hits: 32% R, 44% PG-13, 16% PG, 7% G. On average each movie title was included in 704 questionnaires.

Trained coders counted the number of occurrences of smoking in each movie using methods previously described.²⁶ A smoking occurrence was counted whenever a major or minor character handled or used tobacco in a scene or when tobacco use was depicted in the background (e.g., “extras” smoking in a bar scene). Occurrences were counted irrespective of the scene’s duration or how many times the tobacco product appeared during the scene. Exposure to movie smoking was calculated for each respondent by summing the number of smoking occurrences for each movie the respondent had seen. The measure was adjusted for possible variation in the movie lists by expressing individual exposure to movie smoking as a proportion of the total number of possible smoking occurrences each student could have seen on the basis of the movies included in his/her survey. The proportion was multiplied by 2566 (the number of smoking occurrences in the 398 movies). For the multivariate analyses, exposure to movie smoking was classified into quartiles with the following cutoffs: 0–167 occurrences for the 1st quartile, 168–423 for the 2nd quartile, 424–801 of the 3rd quartile, and 802–2566 for the 4th quartile.

Covariate Adjustment

The following categories of factors were assessed that, based on previous experience, were associated with exposure to movie smoking and adolescent smoking: sociodemographic characteristics (for example, school type, age, sex), social influences (parent smoking, sibling smoking, friend smoking), and other characteristics of the child and family (self reported school performance, personality characteristics (sensation seeking/rebelliousness), TV, DVD and video consumption at weekdays and at the weekend, receptivity to tobacco marketing (do you have a favorite tobacco advertisement?), and parenting style. Reliability was measured using Cronbach’s α .²⁷ Table 1 lists the questions used in the survey to assess these variables, with their reliability.

For the analysis, responses to individual items that measured students’ personality and parenting characteristics were summed, so that higher scores signified more of each characteristic, and scores were split the scores at their median value for the analysis.

Statistical Analysis

The χ^2 -test was used to evaluate the association between trying and current smoking and each of the confounding variables. Lowess (locally weighted scatter plot) smoothed methods were used to graph the form of the relationship between exposure to movie smoking and adolescent smoking.²⁸ Logistic regression analysis was used to determine the crude odds ratios, adjusted odds ratios, and 95% confidence intervals. Firstly, a crude model was fit in which exposure to smoking in films was entered as categories that corresponded to quartiles of exposure in the student sample, with the first quartile of exposure being the reference category. The exposure variable was divided into quartiles to facilitate comparison with studies of U.S. adolescents. Next, controls were added for sociodemographic characteristics only. Then social influence and other characteristics of the child and family were added to the model. Age, and average TV, DVD and Video consumption at weekdays and weekends was entered as continuous variables and school as a random effect to the models (this had no impact on the odds ratios or the statistical significance for the results reported below). All tests were considered significant at the 0.05 level, in a two sided test of significance, and the analysis was performed in August 2006.

RESULTS

Description of the Sample

Of the 5586 adolescents in the sample, the age range was 10–17 years (98% of the sample was in the 11–15 range). When stratified by type of school, recruited schools did not differ in their

composition from the official school statistics ($\chi^2(3)=0.46$; n.s.); thus indicating that the sample is representative for all schools in the area. Many of the adolescents were exposed to smokers, including their fathers (41%), mothers (36%), siblings (21%), and friends (51%). Some 40.7% of the students had ever tried smoking, and 12.3% were current smokers. This smoking rate matches closely with figures from a German national sample, where the rate of current smoking for 12–15 year olds was 12%.²⁹

Exposure to Smoking in Movies

Movie smoking was present in 74% of movies in the total sample of 398 movies. In accordance with previous findings,³⁰ the presence of movie smoking was directly associated with the Motion Picture Association of America rating, with smoking occurrences present in 36%, 48%, 76%, and 88% of G-, PG-, PG-13, and R-rated movies, respectively. Adolescents had seen a mean of 14 (SD: 9) of the 50 movies on their individual list, though which they have received a mean exposure of 69 (SD: 64) movie smoking occurrences. After adjustment, the estimated mean exposure to movie smoking contained in the 398 movies was 550 (SD: 423) smoking occurrences.

Association Between Exposure to Smoking in Movies and Adolescent Smoking

The prevalence of ever tried smoking was 0.41, and the current smoking prevalence was 0.12. The smoothed lowess curves in Figure 2) illustrate a positive curvilinear association between exposure to movie smoking (as a continuous variable) and adolescent ever smoking as well as current smoking. Note that for ever smoking, the prevalence rises from between 0.1 and 0.2 for low-exposure adolescents to include almost all of the high-exposure adolescents, for whom the prevalence is upwards of 0.7. Similarly, whereas the proportion of current smokers among low-exposure adolescents is less than 0.05, the proportion of current smokers in the high exposure range exceeds 0.35.

Relation Between Covariates, Exposure to Smoking in Movies and Adolescent Smoking

Table 2 shows the association between movie smoking exposure and the covariates and adolescent smoking. Adolescent ever and current smoking were strongly associated with movie smoking exposure, age, parent, peer, sibling smoking as well as school type, school performance, student personality, TV, DVD and video consumption, tobacco promotion responsiveness, and parenting behavior. Sex was associated only with ever smoking, not current smoking.

Multivariate Analysis

Adolescents with higher exposure to smoking in films were significantly more likely to try smoking and to smoke currently even after controlling for all covariates identified in Table 2, including sociodemographics, social influences, personality factors, and parenting style. Table 3 gives crude and adjusted odds ratios (ORs) for the relation between movie smoking exposure and smoking. The strength of the adjusted relation with current smoking was not quite as strong as for ever smoking; for example, there was little increased association of current smoking associated with quartile 2 of movie smoking exposure compared with quartile 1. Other notable correlates for trying smoking were friend smoking (AOR 3.5 [95% CI 3.0, 4.1]), sibling smoking (1.9 [1.6, 2.2]), having a favorite cigarette advertisement (4.4 [3.6, 5.4]), sensation seeking/rebelliousness (2.3 [1.9, 2.6]), parenting style (0.8 [0.7, 0.9]), and age (1.3 [1.2, 1.4]). Other correlates for current smoking included friend smoking (16.6 [9.1, 30.3]), sibling smoking (2.0 [1.6, 2.5]), having a favorite cigarette advertisement (9.4 [7.5, 11.9]), sensation seeking/rebelliousness (2.8 [2.1, 3.7]), and age (1.6 [1.4, 1.8]). Parent smoking was not a significantly associated with either outcome variable in this sample of adolescents.

DISCUSSION

To our knowledge, this is the first study to examine the association between exposure to smoking in internationally marketed (primarily Hollywood) movies and child smoking in a European sample of early adolescents, applying survey methods assessing exposure that have thus far only been applied to U.S. adolescents. The association with ever smoking is remarkably similar to the findings among U.S. adolescents,^{11, 12} with a similar dose-response curve,³¹ and with adjusted odds of ever smoking being 1.7–2.2 times greater for adolescents with higher exposure. Moreover, due to the higher prevalence of tobacco use in Germany compared with U.S. adolescents, this study assessed, for the first time, the relation between movie smoking exposure and current smoking. That association also remains statistically significant despite adjustment for a number of possible confounding influences, suggesting that exposure to Hollywood movie smoking is also linked with more advanced adolescent smoking outcomes more closely associated with symptoms of nicotine addiction.^{32, 33}

In previous studies of U.S. adolescents, even after controlling for confounding, between one-third and one half of smoking onset was attributable to exposure to movies.^{11, 14} The large attributable risk is a function of the strong association combined with high exposure. Because of the much higher prevalence of other correlates in the German sample, the attributable risk of movie smoking is likely to be lower there. Nevertheless, this study confirms that individual adolescents in Germany are exposed to thousands of smoking scenes from the imported movies they see there. The typical adolescent in this study was exposed to 423 (median) smoking occurrences from this sample of 398 movies, and that compares with a median exposure of 960 smoking occurrences from a sample of 601 movies in a survey of Northern New England adolescents. In addition, the association was moderately strong and comparable to that seen in two cross-sectional U.S. samples. For example, adjusted odds ratios comparing with the first quartile of movie smoking exposure with the fourth quartile are remarkably consistent across studies: 2.5 for the U.S. Northern New England sample,¹² 2.6 for a national U.S. sample, and 2.2 for the German sample.

Our study has several limitations. Due to the cross-sectional design the temporal sequence of events could not be determined. Thus, prospective studies are needed to show whether seeing tobacco use in films precedes smoking also in other countries. Another limitation is that, because most movies contain smoking, it would be difficult to prove that it is the smoking contained in them that prompts adolescents to smoke and not exposure to depictions of violence or other risk behaviors. Social influence theory would suggest that watching a movie star engage in the behavior would be a powerful motivating force, therefore it is suggested that exposure to movie smoking offers the most logical and parsimonious explanation. Another criticism of the observational research to date has been concern about unmeasured confounding, namely that the movie smoking exposure measure is actually capturing underlying factors, such as parental limit setting or peer behavior that is related to movie viewing and adolescent smoking but is the true causal agent. In this respect, the replication of the association in a culturally different sample of adolescents may add weight to the notion of a causal hypothesis. It would be surprising if the proposed unmeasured agent had the same prevalence and effect size in a country with such different cultural norms around parenting and peer relationships. For example, whereas only about 30% of adolescents in a U.S. sample¹⁴ reported parent smoking, some 54% of German adolescents reported it. Moreover, Germany has few restrictions placed on the marketing of tobacco or the use of tobacco in public buildings and workplaces, higher smoking rates among adults, and higher smoking rates among adolescents (the prevalence of trying smoking is some 4 times higher compared with samples of U.S. adolescents). Consequently, the prevalence of exposure to these socializing agents is much higher than in the U.S.

The strength and consistency of the association between movies and youth smoking across countries, despite very substantive differences in culture and tobacco regulation, argues strongly for smoking in movies as a causal socializing agent for youth smoking in both countries. The results from this study, and the fact that most box office revenues for MPAA studios come from overseas (<http://www.mpa.org/researchStatistics.asp> [accessed 09-30-06]), supports the idea that the MPAA studios may play a role in the cultural acceptance of smoking among adolescents beyond the U.S. through the distribution of movies with smoking.

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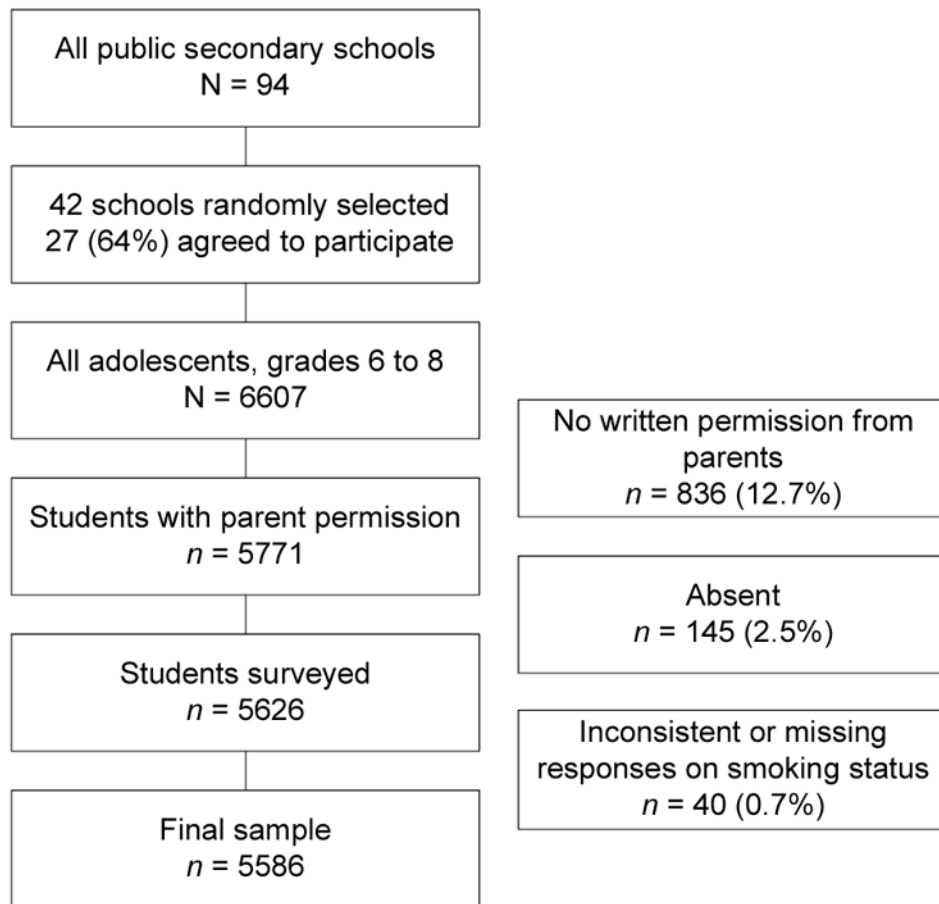


Figure 1. Selection of student sample

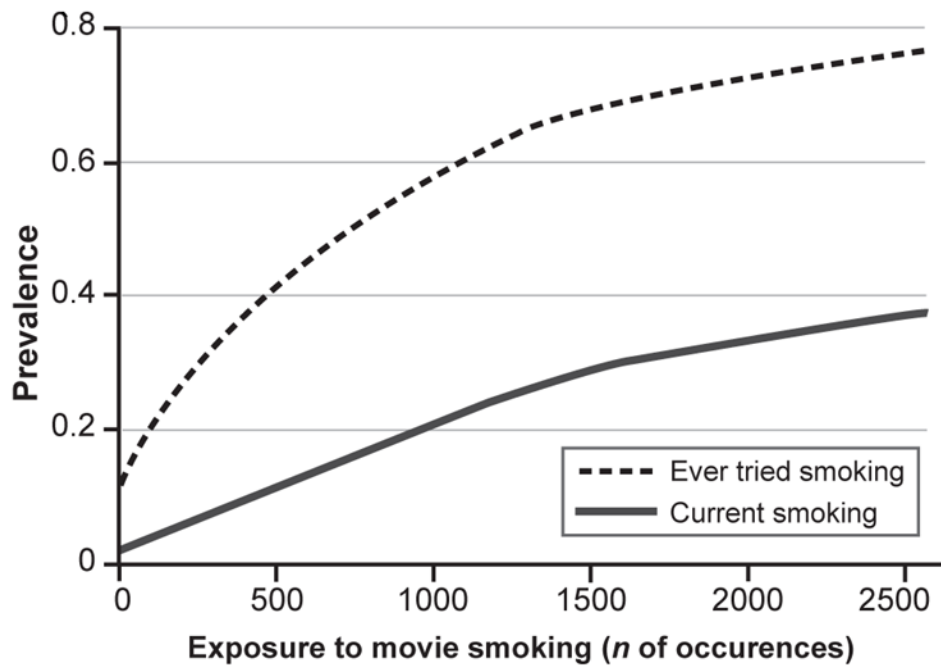


Figure 2. Crude association between exposure to movie smoking and ever respective current smoking

* Exposure to 398 internationally distributed popular contemporary movies.

Table 1
Measures for characteristics of child and parenting

Variable	Questions	Responses
School performance	How would you describe your grades last year?	Excellent Good Average Below average
Sensation seeking & Rebelliousness 12 item index, range 0–36, Cronbach's $\alpha=0.77$	I like to do scary things I get bored being with the same friends all the time I like to do dangerous things 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	Not like me Sort of like me A lot like me Just like me
Parenting style (responsiveness and demandingness 8 item index, range 0–24, Cronbach's $\alpha=0.64$)	She makes me feel better when I am upset She listens to what I have to say She is too busy to talk to me She wants to hear about my problems 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	Not like her Sort of like her A lot like her Just like her

Table 2
Association of trying and current smoking with covariates. Values are numbers (percentages).

	Total sample	Ever tried smoking	p value	Current smoking	p value
Total	5586 (100.0)	2273 (40.7)		686 (12.3)	
Exposure to smoking in movies					
Occurrences of tobacco use in movies seen:					
1. Quartile	1398 (25.0)	235 (16.8)	<0.0001	46 (3.3)	<0.0001
2. Quartile	1396 (25.0)	489 (35.0)		105 (7.5)	
3. Quartile	1397 (25.0)	658 (47.1)		192 (13.7)	
4. Quartile	1395 (25.0)	891 (63.9)		343 (24.6)	
Sociodemographics					
Gender:					
Male	2861 (51.3)	1284 (44.9)	<0.0001	363 (12.7)	n.s.
Female	2717 (48.7)	987 (36.3)		322 (11.8)	
Age (years):					
10–11	833 (14.9)	144 (17.3)	<0.0001	19 (2.3)	<0.0001
12	1509 (27.5)	441 (29.2)		76 (5.0)	
13	1659 (29.7)	728 (43.9)		181 (10.9)	
14	1159 (20.8)	649 (56.0)		226 (19.4)	
15–17	419 (7.5)	308 (73.5)		182 (43.2)	
School type (=socioeconomic status (SES))					
Hauptschule (SES=low)	1707 (30.6)	1035 (60.6)	<0.0001	455 (26.7)	<0.0001
Realschule (SES=mid)	1128 (20.2)	461 (40.9)		108 (9.6)	
Gesamtschule (SES=mixed)	421 (7.5)	157 (37.3)		39 (9.2)	
Gymnasium (SES=mid to high)	2330 (41.7)	620 (26.6)		84 (3.6)	
Social influences					
Any parent smoking (at least one parent)					
No	2577 (46.2)	779 (30.2)	<0.0001	152 (5.9)	<0.0001
Yes	3009 (53.8)	1494 (50.0)		534 (17.7)	
Any siblings smoke:					
No	4371 (79.1)	1481 (33.9)	<0.0001	333 (7.6)	<0.0001
Yes	1154 (20.9)	772 (66.9)		350 (30.2)	
Any friends smoke:					
No	2819 (51.1)	487 (17.3)	<0.0001	13 (0.5)	<0.0001
Yes	2701 (48.9)	1760 (65.2)		668 (24.7)	
Other characteristics of child and parenting					
School performance:					
Excellent	487 (8.9)	123 (25.6)	<0.0001	27 (5.5)	<0.0001
Good	2189 (40.2)	692 (31.6)		158 (7.2)	
Average	2383 (43.8)	1121 (47.0)		346 (14.5)	
Below average	387 (7.1)	286 (73.9)		140 (36.3)	
Sensation seeking and rebelliousness:					
Below median	2873 (51.5)	638 (22.2)	<0.0001	107 (3.7)	<0.0001
Above median	2707 (48.5)	1631 (60.3)		577 (21.3)	
Tobacco promotion responsiveness					
Named no favorite cigarette advertising	4566 (81.7)	1449 (31.7)	<0.0001	224 (4.9)	<0.0001
Named favorite cigarette advertising	1020 (18.3)	824 (80.8)		462 (45.1)	
TV, DVD, video consumption weekdays					
None	188 (3.4)	51 (27.1)	<0.0001	18 (9.5)	<0.0001
About half an hour	586 (10.6)	145 (24.7)		46 (7.9)	
About an hour	1500 (27.0)	467 (31.1)		109 (7.3)	
About two hours	1593 (28.7)	644 (40.4)		151 (9.5)	
About three hours	874 (15.7)	440 (50.3)		145 (16.6)	
About four hours	396 (7.1)	243 (61.4)		96 (24.2)	
More than four hours	417 (7.5)	273 (65.5)		121 (28.8)	
TV, DVD, video consumption weekends					

	Total sample	Ever tried smoking	p value	Current smoking	p value
None	150 (2.7)	57 (38.0)	<0.0001	32 (21.2)	<0.0001
About half an hour	302 (5.4)	90 (29.8)		31 (10.3)	
About an hour	861 (15.5)	250 (29.0)		79 (9.2)	
About two hours	1513 (27.2)	472 (31.2)		127 (8.4)	
About three hours	1248 (22.5)	546 (43.8)		124 (9.9)	
About four hours	756 (13.6)	375 (49.6)		107 (14.2)	
More than four hours	727 (13.1)	471 (64.8)		179 (24.6)	
Parenting (responsive and demanding):					
Below median	2812 (50.5)	1416 (50.4)	<0.0001	444 (15.8)	<0.0001
Above median	2761 (49.5)	854 (30.9)		241 (8.7)	

Table 3
Relation between exposure to movie smoking and adolescent smoking

	Odds ratio (95% confidence interval)		
	Crude	Adjusted for sociodemographics	Adjusted for sociodemographics, social influences, child and parenting characteristics
Movie smoking exposure			
Quartile 1	Reference	Reference	Reference
Quartile 2	2.7 (2.2–3.2)	2.3 (1.9–2.7)	1.7 (1.4–2.1)
Quartile 3	4.4 (3.7–5.3)	3.3 (2.7–4.0)	1.8 (1.5–2.3)
Quartile 4	8.7 (7.3–10.5)	5.7 (4.7–6.9)	2.2 (1.8–2.8)
		Outcome: Current smoking (at least monthly)	
Quartile 1	Reference	Reference	Reference
Quartile 2	2.4 (1.7–3.4)	1.8 (1.2–2.6)	1.4 (0.9–2.2)
Quartile 3	4.7 (3.4–6.5)	3.2 (2.3–4.6)	1.7 (1.1–2.6)
Quartile 4	9.6 (6.9–13.1)	5.8 (4.1–8.2)	2.0 (1.3–3.1)