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Viewing movie smoking undermines antismoking parenting practices

Oglądanie filmów z paleniem tytoniu podważa antytytoniowe wychowanie dzieci

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Additional key words:

adolescent
smoking
media
movies
cross-sectional study
parenting

Dodatkowe słowa kluczowe:

młodzież
palenie tytoniu
media
filmy
badania krzyżowe
wychowanie dzieci

This work was supported
by National Cancer Institute grant CA-77026.

To test the hypothesis that viewing depictions of smoking in movies makes adolescents less responsive to parenting factors that prevent smoking. Cross-sectional survey of 4807 students (grades 5-8) through which we ascertained exposure to smoking in movies, parent smoking, and adolescents' perception of parental responsiveness (support), and parental demandingness (behavioral control). Adolescents attending randomly selected middle schools in the Northeastern U.S. ever tried smoking a cigarette. Exposure to movie smoking was ascertained by counting occurrences of tobacco use in 601 recent popular motion pictures; surveying students to identify films they had seen from a random subset of 50 films; and summing tobacco use occurrences for the films each adolescent reported seeing. We also measured adolescents' perceptions of parent smoking, parental responsiveness and demandingness. The overall prevalence of adolescent smoking was 17.4 percent. The prevalence of smoking increased with exposure to movie smoking (low vs. high exposure 8.8 vs. 25.8%, $p < 0.0001$). Parenting factors associated with lower rates of adolescent smoking were parent non smoking status (11.0% vs. 27.7% for parents who smoke, $p < 0.0001$), higher levels of demandingness (13.7% vs. 20.7% for low demandingness, $p < 0.0001$) and higher levels of parental responsiveness (12.4% vs. 23.1% for low parental responsiveness, $p < 0.0001$). Parenting factors were not strongly associated with exposure to movie smoking. For adolescents with low exposure to movie smoking the adjusted odds (95% confidence interval) of smoking were 0.31 (0.23, 0.42) if parents did not smoke, 0.57 (0.42, 0.78) if parents exerted high demandingness, and 0.52 (0.38, 0.71) if parents were highly responsive. Parents had significantly less influence for adolescents with high exposure to movie smoking, for whom the adjusted odds of smoking were only 0.50 if parents did not smoke ($p = 0.014$ for the interaction effect),

Badania zakładały sprawdzenia hipotezy, że oglądanie w filmach scen z paleniem tytoniu powoduje mniejszą podatność młodzieży na czynniki wychowawcze zapobiegające paleniu tytoniu. W badaniach krzyżowych wzięło udział 4807 uczniów (klas 5-8), u których oceniono narażenie na palenie tytoniu w filmach, palenie rodziców oraz odbiór przez młodzież chęć współpracy rodziców (wsparcia) i wymagania rodziców (kontrola zachowań). Uczestnicy badań zostali wybrani spośród uczniów szkół średnich w południowo-wschodniej części USA, którzy kiedykolwiek podjęli próbę palenia tytoniu. Ekspozycję na palenie tytoniu w filmach ustalono przez policzenie występowania palenia tytoniu w 601 ostatnio wyświetlanych popularnych filmach; poproszono uczniów o wyliczenie spośród 50 losowo wybranych te, które widzieli; podsumowano występowanie palenia tytoniu we wszystkich filmach, które wymienili badani uczniowie. Oceniono również odbiór palenia tytoniu przez rodziców oraz wsparcie rodziców i kontrolę zachowania. W badanej grupie paliło tytoń 17,4% uczniów. Rozpowszechnienie palenia wzrastało w wyniku ekspozycji na filmy, w których palono tytoń (mała do dużej ekspozycji 8,8 w stosunku do 25,8%, $p < 0,0001$). Czynnikaми wychowawczymi związanymi z niskim paleniem młodzieży było niepalenie rodziców (11,0% vs. 27,7% w przypadku rodziców palących, $p < 0,0001$), wysoki poziom kontroli (13,7% vs. 20,7% w przypadku małej kontroli) i wysoki poziom wsparcia rodziców (12,4% vs. 20,7% dla małego wsparcia; $p < 0,0001$). Nie wykazano znaczącego związku pomiędzy czynnikami wychowawczymi a ekspozycją na palenie tytoniu w filmach. U uczniów mało ekspozowanych na palenie w filmach wystrandardyzowane wskaźniki OR (95% przedział ufności) palenia wynosiły 0,31 (0,23, 0,42) w przypadku nie palących rodziców, 0,57 (0,42, 0,78) dla rodziców silnie kontrolujących zachowanie, i 0,52 (0,38, 0,78), jeżeli rodzice udzielali dużego wsparcia. Rodzice mieli dużo mniejszy wpływ na uczniów

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0.97 if parents exerted high demandingness ($p = 0.007$ for the interaction effect) and 0.73 if parents were highly responsive ($p = 0.045$ for the interaction effect). Viewing smoking in movies not only has a direct association with adolescent smoking, it may also undermine parental attempts to prevent this behavior.

Introduction

Exposure to smoking in movies has been linked with adolescent smoking. In an initial study, smoking status of an adolescent's favorite movie star was linked with attitudes and smoking behavior [13,14,42]. Assessment of exposure to movie smoking using the *Beach* method [35], in which a sample of popular contemporary movies is content coded and adolescents queried about whether or not they have seen movie titles, has successfully linked this media exposure with adolescent smoking in cross-sectional [20,34,35,37] and longitudinal studies [11,21,38,43]. In other studies, the effect of exposure to movie smoking on behavior was shown to be mediated through attitudes toward smoking [41] and smoking status of peers [44,45].

Parenting practices have also been shown to modify children's propensity to smoke. One of the most important measures a parent can do is to model nonsmoking themselves. Multiple studies have confirmed an association between parental smoking and smoking among their offspring [2,4,7,9,17,18,40]. Moreover, parental smoking cessation is associated with lower levels of adolescent smoking [5,6,15]. In addition, smoking onset among adolescents may be altered by how parents raise their children. General parenting practices may be viewed in the context of the authoritative parenting construct, originally proposed by *Baumrind* [3]. This construct proposes two domains, responsiveness and demandingness. Responsiveness is related how the adolescent views the parent in terms of their warmth and understanding of and willingness to address the adolescent's issues. Demandingness is related to setting and enforcing limits. The authoritative parent is one who is both responsive and demanding. Children of authoritative parents have lower rates of smoking [8,9,22,27,30,33].

Pierce and colleagues have done a number of studies on tobacco marketing to youth, showing that adolescents who are receptive to marketing messages are more likely to smoke [10,31]. In one, he reported that exposure to tobacco marketing undermines parenting practices that tend to limit adolescent smoking [32]. This caused us to wonder if movie smoking exposure could also undermine effective parenting. In this report, we examine a cross-sectional survey conducted in 1999 on Northern New England adolescents to determine if exposure to movie smoking moderates the protective effect of good parenting practices on smoking. We hypothesize that the protective effect of parent non smoking status and parenting style (high responsiveness, and

silnie eksponowanych na palenie w filmach, dla tej grupy wystandaryzowany współczynnik OR wynosił tylko 0,50 jeżeli rodzice nie palili ($p=0,014$ dla efektu interakcji), 0,97 jeżeli rodzice zwracali dużą uwagę na zachowanie ($p=0,007$ dla efektu interakcji) i 0,73 jeżeli rodzice udzielali dużego wsparcia ($p=0,045$ dla efektu interakcji). Oglądanie palenia w filmach nie tylko wpływa bezpośrednio na palenie tytoniu przez młodzież, ale również osłabia starania rodziców mające na celu zapobieganie paleniu tytoniu.

Table 1
Characteristics of the sample (n = 4807).
Charakterystyka badanej grupy (n=4807).

Variable	Number (% of sample)	Percent Smokers
Grade in school		
5	416 (8.7)	5.5
6	1247 (25.9)	8.3
7	1511 (31.4)	18.6
8	1633 (34.0)	26.3
Sex		
Female	2443 (50.8)	16.0
Male	2364 (49.2)	18.9
Parent education		
Neither HS	247 (5.1)	35.2
One HS	809 (16.8)	28.3
Both HS	3751 (78.1)	13.9
Parent smoking		
Yes	1849 (38.5)	27.7
No	2858 (61.5)	11.0
Authoritative parenting demanding		
Low	2580 (53.7)	20.7
High	2227 (46.3)	13.7
Authoritative parenting responsive		
Low	2256 (46.9)	23.1
High	2551 (53.1)	12.4
Exposure to movie smoking		
Low	2365 (49.2)	8.8
High	2442 (50.8)	25.8

high demandingness) will be undermined by exposure to movie smoking.

Methods

We sent letters to 30 randomly selected New Hampshire and Vermont middle schools with at least 150 students. Half the schools agreed to participate. There was no difference in the socioeconomic profile of participating vs. non participating schools. Fifty two percent of the schools were in rural communities of < 10,000 residents. In September 1999, proctors administered the confidential survey during class time (parents were informed by mail beforehand). The study was approved by the Human Subjects Committee at Dartmouth College.

The average participation by school was 92.5%; 128 (2.1%) parents or students refused participation and 380 (6.3%) were absent. We excluded 683 surveys for missing (N=668) or inconsistent responses (N=15). Excluded students were more likely to be younger (e.g. 5th grade), to report poorer school performance and to have seen fewer films than those with usable surveys, but smoking behavior did not differ.

Ascertainment of exposure to smoking in films

We ascertained exposure to smoking in films using the *Beach* method [39]. First, two content coders counted occurrences of tobacco use in each of 601 popular contemporary films. The details of the content analysis and reliabilities were reported previously [12]. We estimated exposure to these films by asking respondents whether they had seen 50 films randomly selected from the larger pool. Based on the films adolescents reported seeing, we summed the number of movie tobacco occurrences viewed by each survey respondent. Respondents were categorized as either high or low exposure based on a median split.

Primary outcome

Ever tried smoking was determined by the question "How many cigarettes have you smoked in your life?". Responses were categorized as follows: none = never smoker; all other responses (just a few puffs, one to 19 cigarettes, 20-100 cigarettes, more than 100 cigarettes) = tried smoking.

Parenting Factors

We measured three parental factors that relate to teen smoking. Parent non smoking status is associated with lower rates of smoking [1,7,16,24,28]. Parent smok-

Table II
Relationships among parenting factors that affect smoking.

Zależność pomiędzy czynnikami wychowawczymi wpływającymi na palenie tytoniu.

	Authoritative parenting: Responsive	
	Low	High
	N (%)	N (%)
Non smoking parents		
Authoritative parenting: Demanding		
Low	1044 (70.8)	430 (29.2)
High	631 (42.5)	853 (57.4)
One or more smoking parents		
Authoritative parenting: Demanding		
Low	500 (66.4)	253 (33.6)
High	376 (34.3)	720 (65.7)

Table III
Parenting factors that affect smoking and exposure to movie smoking.

Czynniki wychowawcze wpływające na palenie tytoniu i ekspozycja na palenie tytoniu w filmach.

Variable	High exposure to movie smoking
	N (%)
Parent education	
Neither HS	144 (58.3)
One HS	464 (57.4)
Both HS	1834 (48.9)
Parent smoking	
Yes	1133 (61.2)
No	1309 (44.3)
Authoritative parenting: demanding	
Low	1430 (55.4)
High	1012 (45.4)
Authoritative parenting responsive	
Low	1279 (56.6)
High	1163 (45.6)

Table IV
Effect of high movie exposure on the protective effect of parent factors.

Wpływ wysokiej ekspozycji na palenie w filmach na ochronne działanie czynników wychowawczych.

	Adjusted odds of smoking (95% CI)		p-value*
	Low Movie Exposure	High Movie Exposure	
Parent non smoking status	0.31 (0.23, 0.42)	0.50	0.014
Highly demanding	0.57 (0.42, 0.78)	0.97	0.007
Highly responsive	0.52 (0.38, 0.71)	0.73	0.045

* p-value tests the hypothesis that the odds of smoking for the high movie exposure group is significantly different from that of the low movie exposure group; each group was analyzed separately with controls for school, age, sex, and parent education.

ing was determined by responses to two questions: Does your mother (father) smoke cigarettes? (yes, no, don't know, don't have a mother [father]). We also considered two previously validated measures of authoritative parenting that have been linked with teen smoking [26] a demandingness and a responsiveness index. These indexed measures were dichotomized into high/low categories according to a median split.

Statistical analysis

Chi-square or ANOVA analysis was used to evaluate the association between trying smoking and each of the variables. A crude estimate of effect modification was determined by examining the relative risk of trying smoking given a parent protective factor for the low vs. the high movie smoking exposure groups. Interaction terms were used to determine whether exposure to movies resulted in statistically significant modifications of the

effect of parent factors on teen smoking. For each parent factor, we report adjusted odds ratios (OR) and 95% confidence intervals (CI) for parent factors in adolescents with low movie smoking exposure, the odds ratio for those with high movie exposure, and a p-value testing whether the difference in the odds ratios is statistically significant. All tests were considered significant at the 0.05 level and using a two-tailed test. In all analyses we also controlled for sociodemographic characteristics including school, age, sex, and parent education.

Results

Characteristics of the study sample and bivariate relation of the variables with youth smoking.

The study participants (Table I) were in grades 5-8 (ages ranged from 9 to 15 years),

but there were only twenty three 9 year olds and nineteen 15 year olds. They were equally distributed by sex, most had both parents with high school diplomas. Almost 40 percent of the adolescents had one or more parents who smoked. The overall prevalence of adolescent smoking was 17.4 percent. As also shown in Table I, the prevalence of smoking increased with exposure to movie smoking (low vs. high exposure 8.8 vs. 25.8%, $p < 0.0001$).

Parenting factors associated with lower rates of adolescent smoking were parent non smoking status (11.0% vs. 27.7% for parents who smoke, $p < 0.0001$), higher levels of demandingness (13.7% vs. 20.7% for low demandingness, $p < 0.0001$) and higher levels of parental responsiveness (12.4% vs. 23.1% for low parental responsiveness, $p < 0.0001$). The two parenting measures were moderately correlated ($r = 0.38$) but only weakly correlated with movie smoking exposure (r with movie smoking = -0.13 for both measures).

Authoritative parenting practices occur when the adolescent perceives the parent as responsive and demanding. As shown in Table II, parents who smoked were not very different from those who did not with respect to parenting practices.

In fact, slightly more (65.7%) of the smoking parents were perceived as both responsive and demanding compared with non smoking parents (57.4%), but the difference was not statistically significant. However, high exposure to movie smoking was associated with parent smoking (Table III), as well as lower parent education, less parent demandingness and less parent responsiveness.

As previously published, higher exposure to movie smoking was associated with a higher rate of trying smoking. As shown in the figures, higher exposure to movie smoking was also associated with a smaller impact of parenting factors that tend to prevent smoking. Figure 1 illustrates the effect of parental non smoking status according to category of movie smoking exposure.

The effect of non smoking status was stronger for adolescents with low exposure to movie smoking (relative risk = 0.27) compared with those with high exposure to movie smoking (relative risk = 0.52). Figure 2 illustrates the effect of parental demandingness (behavioral control) according to category of movie smoking exposure.

The effect of high demandingness was stronger for adolescents with low exposure to movie smoking (relative risk = 0.51) compared with those with high exposure to movie smoking (relative risk = 0.82). Figure 3 illustrates the effect of parental responsiveness (support) according to category of movie smoking exposure.

The effect of high responsiveness was stronger for adolescents with low exposure to movie smoking (relative risk = 0.43) compared with those with high exposure to movie smoking (relative risk = 0.67). Table IV shows that each of these differences in effect on smoking was statistically significant, even after controlling for the effects of age, sex, and parent education.

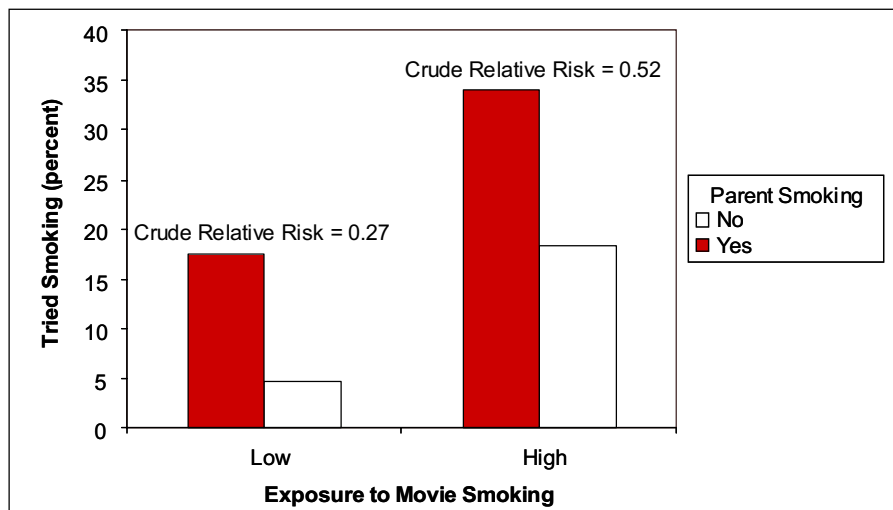


Figure 1
Parent smoking status and adolescent smoking at two levels of exposure to movie smoking.
Palenie rodziców i młodzieży w dwóch poziomach ekspozycji na palenie w filmach.

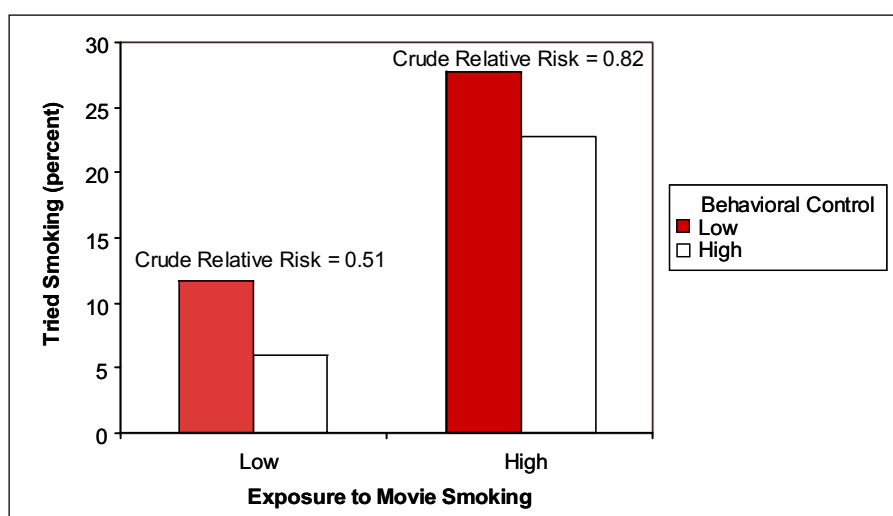


Figure 2
Parental demandingness and adolescent smoking at two levels of exposure to movie smoking.
Kontrola zachowań przez rodziców i palenie młodzieży w dwóch poziomach ekspozycji na palenie w filmach.

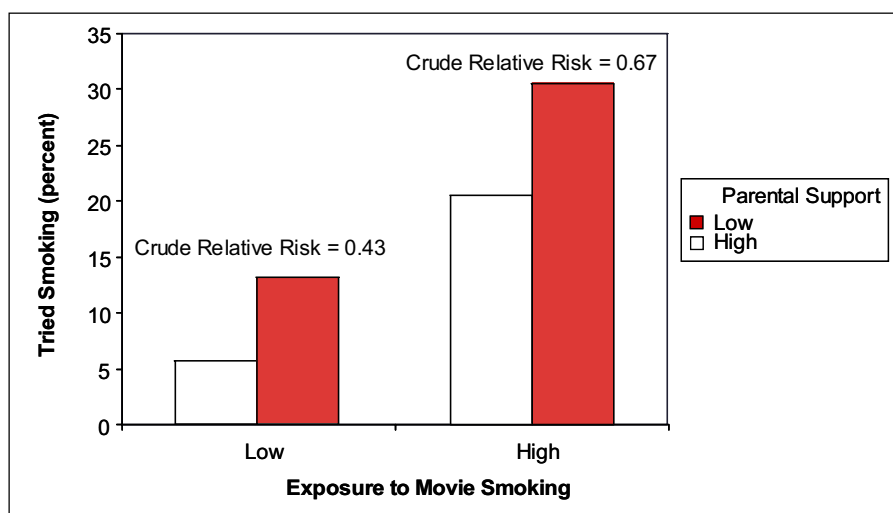


Figure 3
Parental responsiveness and adolescent smoking at two levels of exposure to movie smoking.
Wsparcie rodziców i palenie młodzieży w dwóch poziomach ekspozycji na palenie w filmach.

Discussion

This study provides evidence that adolescents who are highly exposed to movies with smoking are less likely to respond fa-

vorably to protective parenting practices. Few parents really want their children to smoke. Parents can protect their children from smoking or by quitting smoking if they

are current smokers [15]. Moreover, studies have shown that even parents who smoke may be able to socialize their children against smoking [23]. Whether or not they specifically address smoking, parents who tend to be better at setting limits (more demanding) and who have a closer relationship with their children (more responsive) tend to have sons and daughters who smoke less [24,25].

However, other exposures may undermine these constructive parenting practices. *Pierce* found that good parenting practices were undermined when adolescents were exposed to tobacco marketing [32]. This is just one of many reasons why parents and child health advocates should support strict controls on tobacco marketing, as described in the WHO Framework Convention on Tobacco Control [46]. Moreover, parents should consider the role entertainment media plays in causing adolescents to smoke. Recently, the *National Cancer Institute* determined that the relationship between exposure to movie smoking and youth smoking is causal [19]. As the present study points out, not only is exposure to movie smoking a risk factor for youth smoking, but it may undermine protective parenting practices, making them weaker preventive measures. For these reasons, parents should limit their children's exposure to movies with smoking; they may do this by limiting the number of movies their children watch each week and by restricting access to movies rated for older audiences [19,36]. From a policy perspective, child advocates should lobby for movie smoking to be incorporated into the movie ratings systems, which after all, are created to protect children from harmful elements contained in movies.

This study has certain limitations that should be pointed out. The study is cross-sectional, so it is not clear from these data that high movie exposure precedes the blunting of an adolescent's response to good parenting. Moreover, the study does not include controls for some confounding influences that might also affect adolescent smoking, such as friend smoking. Including such controls would tend to make it more difficult to find an interaction effect, but it is unclear from the literature whether this is necessary, as there are many studies in the published literature that focus on interaction effects among only two or three predictor variables.

As a final summary, parents and policy makers should be aware that smoking in movies is a powerful influence on trying smoking among adolescents. This study begins to explore evidence that smoking in movies may have more far-reaching effects, by undermining the strength of protective factors intended to limit smoking among adolescents.

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