

## Brief Report

# Smoking motives in movies are important for understanding adolescent smoking: A preliminary investigation

William G. Shadel, Ph.D.,<sup>1</sup> Steven C. Martino, Ph.D.,<sup>1</sup> Amelia Haviland, Ph.D.,<sup>1</sup> Claude Setodji, Ph.D.,<sup>1</sup>  
& Brian A. Primack, M.D., Ed.M., M.S.<sup>2</sup>

<sup>1</sup> RAND Corporation, Pittsburgh, PA

<sup>2</sup> University of Pittsburgh School of Medicine, Pittsburgh, PA

Corresponding Author: William G. Shadel, Ph.D., RAND Corporation, 4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213, USA.  
Telephone: 412-683-2300, ext. 4489; Fax: 412-683-2800; E-mail: shadel@rand.org

Received March 22, 2010; accepted May 22, 2010

## Abstract

**Introduction:** Exposure to smoking in movies is strongly associated with smoking uptake and maintenance among adolescents. However, little is known about what features of movies (e.g., the context for smoking or motives for a character smoking) moderate the association between exposure to movie smoking and adolescent smoking. This laboratory study examined whether exposure to movie smoking that is portrayed as having a clear motive is associated with the desire to smoke differently than smoking that is portrayed as having no clear motive.

**Methods:** A sample of 77 middle school students (mean age of 12.8 years, 62% male, 60% Caucasian) viewed movie clips that portrayed smoking as helping to facilitate social interaction, to relax, to appear rebellious, or as having no clear motive. After exposure to each clip, participants rated their desire to smoke.

**Results:** Exposure to clips where smoking was portrayed as helping characters to relax was associated with a significantly stronger desire to smoke compared with clips where the motive for smoking was unclear. Desire to smoke was similar for clips where no motive was clear, social smoking clips, and rebellious smoking clips.

**Discussion:** These results suggest that the way that smoking is portrayed in movies is important in determining its effect on adolescent smoking.

## Introduction

Adolescents are exposed to hundreds of smoking impressions in movies annually (Sargent, Tanski, & Gibson, 2007), and these exposures are strongly associated with their smoking (Dalton et al., 2003, 2009; Sargent et al., 2002, 2005; see also DiFranza et al., 2006; National Cancer Institute [NCI], 2008; Wellman, Sugarman, DiFranza, & Winkoff, 2006). An emerging literature has begun to shed light on psychosocial mechanisms (e.g., positive expectancies)

that mediate these exposure effects (Sargent et al., 2002; Wills, Sargent, Stoolmiller, Gibbons, & Gerrard, 2008; Wills et al., 2007). In addition to understanding mediational mechanisms, it is important to understand whether *character motives* for smoking influence the impact of these portrayals. For example, movie smoking that is portrayed as having a motive (e.g., as a way to relax, to facilitate socializing, or to appear rebellious; Dalton et al., 2002; Worth, Duke, Green, & Sargent, 2007) may affect adolescents differently than that portrayed as having no motive. These portrayals may then foster vicarious learning of associations between smoking and positive outcomes (e.g., relaxation) which in turn could prompt adolescent smoking (see Johnson et al., 2003; Piko, Wills, & Walker, 2007; Wills, Sandy, & Shinar, 1999; see also Bandura, 2006). However, research has yet to examine associations between exposure to different motives for movie smoking and adolescent smoking.

This preliminary laboratory study examined whether exposure to movie smoking that is portrayed as having a clear motive (i.e., as helping characters to socialize, to relax, or to appear rebellious) has a different association with desire to smoke compared with smoking that is portrayed as having no clear motive. We had no specific hypotheses about which motive would be more strongly associated with desire to smoke in this exploratory study.

## Methods

### Participants

This study was approved by the Institutional Review Board at RAND. A total of 77 never-smoking adolescents, recruited using media advertising, participated (62% male; 60% Caucasian; 14% Black; and 25% multiethnic). Their mean age was 12.8 years ( $SD = 1.0$ ). A majority of the sample reported that both parents worked (more than 77%).

### Procedures

Smoking and non-smoking clips were selected from 28 wide-release movies (rated PG to R). The smoking scenes were initially

doi: 10.1093/ntr/ntq099

Advance Access published on June 24, 2010

© The Author 2010. Published by Oxford University Press on behalf of the Society for Research on Nicotine and Tobacco.

All rights reserved. For permissions, please e-mail: journals.permissions@oxfordjournals.org

sorted by study team consensus into four smoking motives categories (see Worth et al., 2007; categorizations used for the final analyses were determined by examining participant data; see Results section below): (a) characters smoking to relax, (b) characters smoking to facilitate social interaction, (c) characters smoking to appear rebellious, or (d) characters smoking where no motive was apparent. A total of 32 smoking scenes (8 per motive category) were selected. Next, non-smoking scenes were selected from the same movies where the same characters that appeared in the smoking scenes were present and where the tone of the scene was similar to that of the identified smoking clip, yielding 32 non-smoking clips. The smoking and non-smoking scenes were trimmed into roughly 2-min segments that provided some context and character development. None of the clips contained sexual, profane, or violent content.

Because of concerns we had with adolescents viewing all the smoking clips at once (i.e., massed exposure to 32 smoking movie clips in a single session), four exposure conditions were created. Each exposure condition contained a unique mix of eight smoking and eight non-smoking clips, and the clips could originate from any of the motive categories. Smoking clips and non-smoking clips were presented in random alternating orders within condition (i.e., smoking clip—non-smoking clip—smoking clip, etc).

Participants completed the study in small groups (informed consent was obtained from participants' parents), and different groups were randomly assigned to one of the four exposure conditions. Participants first completed baseline measures (e.g., smoking attitudes, perceived smoking risk, self-efficacy, and prior exposure to movie smoking) and then were exposed to their assigned movie clips. After exposure to each clip, participants completed several measures (measures were completed after each clip exposure individually; see below). Finally, participants were debriefed; given a 45-min interactive media literacy intervention on cigarette advertising and movie smoking to help them understand, analyze, and criticize those media messages, with the goal of buffering any potentially harmful effects of clip exposure (see Brown, 2006; Primack, Gold, Land, & Fine, 2006); and compensated with \$25.

## Dependent measure

Postclip exposure desire to smoke was assessed after exposure to each movie clip with the following question, "How much did this clip make you want to smoke?" (1 = *not at all* and 10 = *a lot*). This question has been shown to be responsive to adolescents' responses to cigarette print advertising in other studies (Shadel, Tharp-Taylor, & Fryer, 2008, 2009).

## Other postexposure measures

In order to potentially control for variables identified in other research as important to adolescents' responses to advertising (see Moore & Lutz, 2000), several other measures were given after exposure to each movie clip: (a) "How did this movie clip make you feel?" (1 = *very sad* to 10 = *very happy*), (b) "How interesting was this movie clip?" (1 = *not at all interesting* to 10 = *very interesting*), (c) "How much did this movie clip make you think?" (1 = *not at all* to 10 = *a lot*), (d) "How much did you like this movie clip?" (1 = *not at all* to 10 = *a lot*), (e) "How realistic was this movie clip?" (1 = *not at all* to 10 = *a lot*), and (f) "How much would you like to see the whole movie that this clip

was taken from?" (1 = *not at all* to 10 = *a lot*). Participants were also asked whether the clip they just viewed contained smoking (*no* and *yes*) and, if yes, whether the actors were smoking to help them: (a) relax, (b) socialize with other people, (c) look like a rebel, or (d) none of the above.

## Results

### Narrowing the set of movie clips for analysis

First, we eliminated five smoking clips in which too few participants noticed the smoking. Second, we sorted the remaining 27 clips into groups based on whether participants recognized a dominant smoking motive. Relaxation was the dominant smoking motive in six clips, social facilitation was the dominant smoking motive in five clips, and a desire to appear rebellious was the dominant smoking motive in five clips. An average of 63% of participants recognized the dominant motive across categories. Of the remaining 11 clips, we selected 6 to represent the no smoking motive category because they had the highest percentage of participants say that there was no clear motive.

### Investigating the distribution of the dependent variable

Participants uniformly reported no desire to smoke after seeing the non-smoking clips, so we restricted our analysis to responses to smoking clips only. In response to the smoking clips, participants provided a restricted range of responses on the dependent measure (desire to smoke), so we dichotomized responses on it such that a response of 1 on the original 1–10 scale was rescored to 0, representing no desire to smoke postexposure, and responses  $\geq 1$  on the original scale were rescored to 1, representing any desire to smoke (see Pierce, Choi, Glipin, Farkas, & Merritt, 1996).

### Exploring potential confounding variables in the movie clips

We evaluated whether participants' opinions (see other postexposure measures above) of movie clips varied by motive condition to determine whether we needed to control for these variables in further analysis. Table 1 shows the results of these bivariate analyses. In a logistic regression predicting desire to smoke from each of these potential confounding variables, the only significant predictor of desire to smoke was how much the movie clip made participants think ( $p = .011$ ). The only other variable that was close to statistical significance in this model was how the clip made participants feel ( $p = .112$ ). We included these two variables as controls in the analyses that are described next.

### Predicting desire to smoke from movie smoking motives

We estimated a logistic regression model that included as predictors of desire to smoke three indicators of motive type, social, relaxation, and rebellious with the no smoking motive type as the comparison category. This model also controlled for participants' gender, race (non-White vs. White), grades in school (A's vs. all other grades), and the two potential confounding variables described above. Because each participant watched multiple movie smoking clips, variance parameters for these

**Table 1. Mean comparison of participants' responses to movies with different smoking motive types**

Variable	Smoking motive type <sup>a</sup>								F <sup>b</sup>	p
	Uncertain (n = 122)		Social (n = 71)		Relaxation (n = 112)		Rebellious (n = 92)			
	M	SD	M	SD	M	SD	M	SD		
How clip made participants feel <sup>c</sup>	5.11	1.83	5.06	1.73	4.68	2.30	5.60	1.96	3.60	.014
Interest in the clip <sup>d</sup>	5.67	2.99	4.09	2.59	5.57	2.98	6.44	2.65	9.14	<.001
Liking for the clip <sup>e</sup>	5.14	2.93	3.89	2.59	5.20	2.88	5.85	2.81	6.50	.003
Perceived realism of the clip <sup>e</sup>	5.02	2.77	5.26	2.59	4.68	2.57	5.46	2.65	1.54	.203
Desire to see full movie <sup>e</sup>	5.28	3.27	4.27	3.03	5.32	3.21	5.96	3.35	3.62	.013
How much clip made participants think <sup>e</sup>	4.65	2.82	3.93	2.37	5.12	2.81	4.99	2.54	3.18	.024

Note. <sup>a</sup>The n's beneath each motive type refer to the number of clip observations per condition.

<sup>b</sup>Numerator *df* for the *F* test is 2. Denominator *df* range from 294 to 389.

<sup>c</sup>1 = *very sad* to 10 = *very happy*.

<sup>d</sup>1 = *not at all* to 10 = *very*.

<sup>e</sup>1 = *not at all* to 10 = *a lot*.

models were adjusted for clustering of responses within participant using SURVEYLOGISTIC procedure in SAS (v. 9.2). As shown in Table 2, there was a significant association between smoking motive type and participants' desire to smoke following exposure to the movie clips (goodness of fit: *c*-statistic = .733). Participants were more likely to report a desire to smoke after seeing movie clips in which characters smoked to relax compared with those in which there was no clear smoking motive (*p* = .046). Neither desire to smoke in social smoking clips (*p* = .129) nor desire to smoke in rebellious clips (*p* = .213) was significantly different from clips with an unclear motive. A second logistic regression model added baseline smoking attitudes, perceived smoking risk, self-efficacy, and prior exposure to movie smoking, but their inclusion did not substantively change these results.

## Discussion

Increasing exposure to smoking in movies contributes to increases in adolescent smoking (Dalton et al., 2009; DiFranza et al., 2006; NCI, 2008; Wellman et al., 2006). Although psychosocial

mechanisms that mediate this association have been explored (Sargent et al., 2002; Wills et al., 2007, 2008), research has not yet examined whether the way that smoking is portrayed in movies affects its influence on adolescent smoking. Portrayals of smoking to relax, appear rebellious, and facilitate social interactions are common in movies (Worth et al., 2007), and adolescents who believe that smoking will help serve such motives are more generally at greater risk of smoking (Johnson et al., 2003; Wills et al., 1999, 2007).

This study provides initial evidence that the way in which smoking is portrayed in movies matters in determining its influence on adolescents' orientation toward smoking. In particular, we found that smoking that is portrayed as facilitating relaxation—but not smoking that is portrayed as facilitating social interaction or a desire to appear rebellious—more strongly relates to adolescents' desire to smoke than smoking that is portrayed as serving no clear motive. Smoking to ameliorate negative affect is a potent reason for smoking among adolescents (Johnson et al., 2003). Our findings suggest that adolescents learn about this smoking motive (and possibly others) from exposure to movies that clearly portray smoking as having

**Table 2. Logistic regression model predicting desire to smoke following exposure to smoking in movie clips**

Predictor	<i>b</i>	<i>SE</i>	Wald $\chi^2$	<i>p</i> value	<i>OR</i>	95% <i>CI</i>
Motive type: Social <sup>a</sup>	1.056	0.695	2.310	0.129	2.874	0.737–11.216
Motive type: Relaxation <sup>a</sup>	0.955	0.479	3.971	0.046	2.597	1.016–6.642
Motive type: Rebellious <sup>a</sup>	0.834	0.670	1.550	0.213	2.303	0.619–8.560
Male gender	0.385	0.558	0.477	0.490	1.470	0.492–4.388
Non-White race	–0.226	0.632	0.128	0.720	.797	0.231–2.751
Gets mainly A's in school	0.274	0.749	0.134	0.714	1.316	0.303–5.712
How the clip made subjects feel	0.126	0.083	2.304	0.129	1.134	0.946–1.334
How much the clip made subjects think	0.205	0.086	5.703	0.017	1.227	1.037–1.452

Note. *OR* = odds ratio.

<sup>a</sup>The comparison (holdout) category was the “unclear motive type.”

such a function. In theory (Bandura, 2006), such learned motives then come to regulate smoking behavior. Although not all smoking in movies is shown with reference to a specific motive, between 35% and 46% of portrayals do incorporate motives (Worth et al., 2007). From a policy or intervention standpoint, it may be prudent to focus on these types of portrayals as they may be most likely to have an impact on adolescents' desire to smoke.

Our study also makes a methodological contribution. Studies of smoking in adolescents face ethical and methodological challenges (Moolchan & Mermelstein, 2002). Research on adolescent exposure to smoking media may be particularly challenging in that researchers are rightly wary of exposing adolescents to cigarette advertisements or movie clips on the assumption that doing so could increase their chances of smoking in the future. The methods of this study were designed to minimize this risk (e.g., alternating smoking and non-smoking clips; presenting a media literacy intervention) and in doing so provided new methodological information for the field.

There are limitations to this study. First, desire to smoke was the main dependent variable, not actual smoking behavior. Second, the sample of movie clips was selective. Therefore, these results may not generalize to other instances of movie smoking. Third, the study employed a reactively recruited sample of early adolescent never-smokers; our findings may not generalize to other populations of adolescents. Despite these limitations, the results of this study suggest that how smoking is portrayed in movies is important for understanding the influence of such portrayals on adolescent smoking. Future research using randomized experimental designs and prospective designs would further advance knowledge in this domain of inquiry.

## Funding

This research was supported by R01 DA022496.

## Declaration of Interests

None declared.

## Acknowledgments

Special thanks are due to Rachel Burns, Jill Schaeffer, Sarah Frith, Preethi Saama, and Michelle Horner for their invaluable assistance in executing the procedures of this research.

## References

- Bandura, A. (2006). Adolescent development from an agentic perspective. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 1–43). Charlotte, NC: Information Age Publishing.
- Brown, J. D. (2006). Media literacy has potential to improve adolescents' health. *Journal of Adolescent Health, 39*, 459–460.
- Dalton, M. A., Beach, M. L., Adachi-Mejia, A. M., Longacre, M. R., Matzkin, A. L., Sargent, J. D., et al. (2009). Early exposure to movie smoking predicts established smoking by older teens and young adults. *Pediatrics, 123*, e551–e558.
- Dalton, M. A., Sargent, J. D., Beach, M. L., Titus-Ernstoff, L., Gibson, J. J., Ahrens, M. B., et al. (2003). Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. *Lancet, 362*, 281–285.
- Dalton, M. A., Tickle, J. J., Sargent, J. D., Beach, M. L., Ahrens, M. B., & Heatherton, T. F. (2002). The incidence and context of tobacco use in popular movies from 1988–1997. *Preventive Medicine, 34*, 516–523.
- DiFranza, J. R., Wellman, R. J., Sargent, J. D., Weitzman, M. J., Hipple, B. J., & Winickoff, J. P. (2006). Tobacco promotion and the initiation of tobacco use: Assessing the evidence for causality. *Pediatrics, 117*, e1237–e1248.
- Johnson, J. L., Bottorff, J. L., Moffat, B., Ratner, P. A., Shoveller, J. A., & Lovato, C. Y. (2003). Tobacco dependence: Adolescents' perspectives on the need to smoke. *Social Science & Medicine, 56*, 1481–1492.
- Moolchan, E., & Mermelstein, R. (2002). Research on tobacco use among teenagers: Ethical challenges. *Journal of Adolescent Health, 30*, 409–417.
- Moore, E., & Lutz, R. (2000). Children, advertising, and product experiences: A multimethod inquiry. *Journal of Consumer Research, 27*, 31–48.
- National Cancer Institute (NCI). (2008). *The role of the media in promoting and reducing tobacco use*. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. (Tobacco Control Monograph No. 19; NIH Publication No. 07-6242).
- Pierce, J. P., Choi, W. S., Glipin, E. A., Farkas, A. J., & Merritt, R. K. (1996). Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. *Health Psychology, 15*, 355–361.
- Piko, B., Wills, T. A., & Walker, C. (2007). Motives for smoking and drinking: Country and gender differences in samples of Hungarian and US high school students. *Addictive Behaviors, 32*, 2087–2098.
- Primack, B. A., Gold, M. A., Land, S. R., & Fine, M. J. (2006). Association of cigarette smoking and media literacy about smoking among adolescents. *Journal of Adolescent Health, 39*, 465–472.
- Sargent, J. D., Beach, M., Adachi-Mejia, A., Gibson, J., Titus-Ernstoff, L., Carusi, C., et al. (2005). Exposure to movie smoking: Its relation to smoking initiation among U.S. adolescents. *Pediatrics, 116*, 1183–1191.
- Sargent, J. D., Dalton, M. A., Beach, M. L., Mott, L. A., Tickle, J. J., Ahrens, M. B., et al. (2002). Viewing tobacco use in movies: Does it shape attitudes that mediate adolescent smoking? *American Journal of Preventive Medicine, 22*, 137–145.
- Sargent, J. D., Tanski, S. E., & Gibson, J. (2007). Exposure to movie smoking among U.S. adolescents aged 10 to 14 years: A population estimate. *Pediatrics, 119*, e1167–e1176.
- Shadel, W. G., Tharp-Taylor, S., & Fryer, C. S. (2008). Exposure to cigarette advertising and adolescents' intentions to smoke:

## Motives for movie smoking

The moderating role of the developing self-concept. *Journal of Pediatric Psychology*, 33, 751–760.

Shadel, W. G., Tharp-Taylor, S., & Fryer, C. S. (2009). How does exposure to cigarette advertising contribute to smoking in adolescents? The role of the developing self-concept and identification with advertising models. *Addictive Behaviors*, 34, 932–937.

Wellman, R. J., Sugarman, D. B., DiFranza, J. R., & Winkoff, J. P. (2006). The extent to which tobacco marketing and tobacco use in films contribute to children's use of tobacco: A meta-analysis. *Archives of Pediatric and Adolescent Medicine*, 160, 1285–1296.

Wills, T. A., Sandy, J., & Shinar, O. (1999). Cloninger's constructs related to substance use level and problems in late adolescence: A mediational model based on self-control and coping

motives. *Experimental and Clinical Psychopharmacology*, 7, 122–134.

Wills, T., Sargent, J., Stoolmiller, M., Gibbons, F., & Gerrard, M. (2008). Movie smoking exposure and smoking onset: A longitudinal study of mediation processes in a representative sample of U.S. adolescents. *Psychology of Addictive Behaviors*, 22, 269–277.

Wills, T. A., Sargent, J. D., Stoolmiller, M., Gibbons, F. X., Worth, K. A., & Dal Cin, S. (2007). Movie exposure to smoking cues and adolescent smoking onset: A test for mediation through peer affiliations. *Health Psychology*, 26, 769–776.

Worth, K. A., Duke, J., Green, M., & Sargent, J. D. (2007). *Character smoking in top box office movies*. Washington, DC: American Legacy Foundation, First Look Report.