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Exposure to Smoking in Movies and Smoking Initiation Among Black Youth

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Abstract

Background—Black adolescents see more substance use in mainstream media but seem less responsive to it than other U.S. adolescents. Black-oriented media may be more personally relevant to them.

Purpose—To determine smoking exposure separately for black-oriented (BSME) and mainstream (MMSE) movies and assess their longitudinal relationships with smoking among black and other-race adolescents.

Methods—Two-wave (2007–2009) national cohort survey of 2341 nonsmoking (at baseline) U.S. adolescents (aged 13–19 years), analyzed in 2012. The surveys determined BSME and MMSE based on respondents' exposure to random subsets of 50 movies from a contemporary sample of 95 black-oriented and 288 mainstream movies previously content-coded for smoking. Outcome was smoking initiation.

Results—Black teens had significantly more BSME and MMSE than other teens (p 's <0.001). At follow-up, 23.5% of black and 29.0% of nonblack respondents had tried smoking. Among black respondents, BSME was related to smoking initiation at follow-up but MMSE was not. For other adolescents, both BSME and MMSE were related to smoking initiation.

Conclusions—A prospective relationship was found between exposure to smoking in movies and smoking initiation. Among black adolescents in the U.S., this was only for black-oriented movies, suggesting the importance of personal relevance of the exposures. Parents, practitioners, and producers should be aware of these potential influences of media on black teen viewers.

Introduction

Black youth in the U.S. consume more,^{1,2} riskier^{3–6} media than their peers of other backgrounds. This finding has raised concern because media use has implications for time spent in other activities^{7,8} and exposure to violence, sex, and substance use in media predict subsequent aggression,^{9,10} sexual precocity,^{3,11} alcohol consumption and smoking initiation, respectively.^{12–15} The research evidence has led the U.S. Surgeon General to conclude that

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the effect of movie smoking exposure on smoking initiation is causal¹⁶; it would appear that black youth are at particular risk.

However, relationships between media exposures and risk outcomes observed in predominantly white samples of adolescents may not hold among black youth.³ Black adolescents appear less receptive to tobacco advertising,¹⁷ and exposure to R-rated movies predicts smoking initiation among white, but not black youth.⁶ Prior research with some participants included in this study suggests racial differences in movie smoking exposure effects: black youth saw substantially more substance use in movies than white youth, but the relationships of exposures with substance-related outcomes^{5,18,19} were weaker for the black teens.

Proposed explanations for this “paradox” (higher exposures, but fewer effects) include greater resistance to social influence⁵ and ethnic identity.²⁰ A psychological disconnect between mainstream media characters and black viewers could explain the paradox.^{5,6} One study¹⁹ examined exposure to smoking by black and white characters: among black adolescents, exposure to black (but not white) character smoking predicted time to smoking initiation, but only among those whose parents do not smoke (among white adolescents, all character smoking was predictive). Thus, these moderation effects may be at least partly due to measuring media exposures that are not psychologically relevant for black youth.

Black (versus white) youth consume more entertainment media featuring black casts and concerns (so-called “black-oriented” media).²¹ The most popular movies among black participants in this sample were those identified by independent raters as black-oriented (targeted toward a black audience, and having predominantly black casts); these movies were less popular among other groups of youth (S Dal Cin, University of Michigan, unpublished observations, 2012). Preference for black-oriented media among black audiences is understandable from social-cognitive²² and social identity perspectives.^{23,24} Same-race media characters may provide relevant models for social comparison while facilitating the maintenance of a positive ingroup identity²⁵; black children report feeling greater identification with black TV figures.²⁶ Therefore, relationships between media and outcomes among black youth should be more likely in response to black-oriented than to mainstream media.

The current study examines the relationships between exposure to smoking in black-oriented and mainstream movies and black adolescents’ smoking initiation. Previous research shows effects of movie smoking exposure (irrespective of character race/ethnicity) on smoking initiation^{14,15,27–29} among white and Hispanic, but not black youth.⁶ This finding could reflect a lack of statistical power (small samples of black youth with low rates of smoking initiation during early adolescence).

A more interesting possibility is that exposure to smoking in mainstream movies (MMSE; the bulk of all exposure, featuring predominantly white characters and concerns) actually has no effect on black youth, whereas exposure to movie smoking in black-oriented movies (BMSE; less plentiful, but likely more psychologically relevant) relates to smoking initiation (controlling for covariates). The findings for black character smoking provide preliminary support for this hypothesis.¹⁹ The current study replicates and extends that analysis in a sample including (1) data from those participants, collected 2 years later; (2) an additional sample of black adolescents; and (3) exposure to smoking in black-oriented movies (not black character smoking). This last aim is informed by the work of scholars conducting research with black audiences,³⁰ who note differing psychological responses to mainstream versus black-oriented media.

Prior research shows black teens are exposed to more smoking from both black and white characters than are white teens, but exposure to white character smoking far exceeds exposure to black character smoking.¹⁹ Yet the relatively small number of black-oriented movies included in earlier surveys likely underestimated movie smoking exposure among black teens. This study includes a larger sample of black-oriented movies than previous studies. The current authors hypothesize that there are higher levels of BMSE among black (versus other) viewers. Further, it is hypothesized that among black viewers, exposure to BMSE (but not MMSE) will predict increased likelihood of smoking initiation. Among nonblack viewers, both types of exposures will predict initiation.

Methods

The current study involves data from the 5th (W5) and 6th (W6) waves of the Dartmouth Media Study, an ongoing longitudinal survey of adolescents in the U.S. whose methods have been described in detail elsewhere.¹⁵ At W5, respondents were asked about a larger number of movies featuring black actors. W6 provides the most recent data available. Analyses were conducted in 2012.

Participants and Procedure

Participants were 2341 never-smokers (52% female) aged 13–19 years ($M=15.51$, $SD=1.34$) from the 3653 adolescents surveyed at W5. These 3653 adolescents included 3055 respondents from Waves 1–4, plus 598 adolescents from a replacement sample of black youth (eligible $n=807$). The W5 (March–October 2007) and W6 (July–October 2009) computer-assisted telephone interview (CATI) surveys were conducted by Westat Inc (Rockville MD).

Race was determined by self-identification; of 2341 never-smokers, 1343 identified themselves as exclusively white, 554 as exclusively black, 285 as Hispanic (regardless of race). Another 159 indicated something other than Hispanic ethnicity or exclusively black or white race. Given the primary interest in black youth and relatively small numbers of Hispanic or not exclusively black or white teens, the analysis compares black youth ($n=554$) with their nonblack peers ($n=1787$).

Measures

To identify movies as black-oriented or mainstream, a group of students (naïve to the study purpose) were shown a list of 383 movie titles. Using holistic judgment based on knowledge of the films, they indicated whether the film was black-oriented (targeted toward a black audience); mainstream (not targeted toward a black audience); or unknown to them. Krippendorff's alpha³¹ among five coders was 0.70; in all, 288 movies (75.20%) were coded as mainstream; and 95 (24.80%) as black-oriented. To quantify smoking in each movie, a separate group of professional coders watched each movie and recorded occasions in which tobacco appeared on screen, using previously reported procedures.^{15,32}

At W5, BMSE and MMSE was determined using the Beach method,³³ which involves surveying respondents about whether they had seen each of 50 different movie titles. Each adolescent received a unique list of titles randomly selected from the larger set of 383 movies, stratified by rating and whether it contained black character smoking or drinking (median number of black-oriented movies per survey was ten). Survey data were combined with coding data to compute number of smoking occurrences each child saw in black-oriented and mainstream movies. For each type of movie, occurrences for movies that the child reported seeing were summed, and then divided by the number of occurrences in the movies (black-oriented and mainstream) the child had been asked about; this proportion was

multiplied by the total number of tobacco occurrences in the 95 black-oriented and 288 mainstream films. For smoking initiation models, BMSE and MMSE were centered about a value of 200 and rescaled (i.e., divided) by 400.

Smoking initiation by W6 was assessed using a single item: *Have you ever tried smoking cigarettes, even just a puff?* Covariates included child demographics (i.e., gender, age, SES); child personality characteristics (i.e., conduct disorder symptoms, sensation-seeking); social influences (i.e., peer and sibling smoking, parental responsiveness and monitoring); and other media exposures (i.e., hours of TV per day, presence of TV in the bedroom).

Data Analysis

In order to test the proposed hypotheses, logistic regression was used to predict the log odds of smoking initiation by W6, with W5 MMSE and BMSE as focal predictors. The model adjusted for covariates typically associated with smoking initiation and/or movie viewing. As the hypotheses relate to differences in the effects of various types of exposures *within* racial groups, not the differences *between* the groups, dose–response curves for MMSE and BMSE were estimated separately for black and nonblack youth, by including dummy variables for both black and nonblack groups (and excluding the constant term to prevent multicollinearity).

In addition to these intercepts (black and nonblack dummy variable indicators), the model included linear (product terms of black and nonblack dummy variables with MMSE and BMSE) and quadratic effects (product terms of black and nonblack dummy variables with MMSE squared and BMSE squared) of movie smoking exposures within each group. All terms entered in the model are presented in Table 2. Further details of the model parameterization are given in Appendix A (available online at www.ajpmonline.org).

Results

Of 2341 nonsmokers surveyed at baseline, 1822 (77.8%) participated in the follow-up. Black respondents (retained $n=379$) were more likely than nonblack respondents (retained $n=1443$) to be lost to follow-up ($\chi^2_1=37.31$, $p<0.001$). Logistic regression analysis predicting attrition by race revealed that among black participants, lower SES was a significant predictor of attrition (OR=0.80; 95% CI=0.64, 0.99). Among other respondents, attrition was significantly associated with older age (OR=1.10, 95% CI=1.01, 1.21); lower SES (OR=0.59, 95% CI=0.51, 0.69); higher sensation-seeking (OR=1.06, 95% CI=1.01, 1.12); more parental responsiveness (OR=1.05, 95% CI=1.00, 1.10); and having more friends who smoke (OR=1.28, 95% CI=1.01, 1.63).

Exposure to MMSE was unrelated to attrition, but higher exposure to BMSE was related to attrition for both groups (OR_{black}=2.83, 95% CI= 1.43, 5.57; OR_{nonblack}=1.77, 95% CI=1.01, 3.12). Descriptive statistics for adolescents who responded at both waves are presented in Table 1. Being black was associated with having lower SES; having a bedroom TV (77% vs 53%, $p<0.001$); watching more TV per day, greater conduct-disorder symptoms, less sensation-seeking, and having a sibling that smokes (17% vs 12%, $p<0.001$). Also, there was a higher proportion of girls in the black sample (56% vs 51%, $p<0.05$), but no differences in age, parental responsiveness, demandingness, or peer smoking.

Of nonblack youth surveyed at W5, 23.7% had seen no black-oriented movies on their list, and thus had seen no smoking in those movies. Conversely, of the black respondents, only 5 (<1%) had seen no black-oriented movies. BMSE and MMSE differed by type of movie ($F_{1,2339} = 1349.47$, $p<0.001$); audience race ($F_{1,2339}=4644.64$, $p<0.001$); and their interaction ($F_{1,2339}=79.92$, $p<0.001$). Black respondents had significantly more BMSE and

MMSE than did other respondents (p 's < 0.001), and this difference was larger for BMSE than for MMSE (Appendix B, available online at www.ajpmonline.org).

At W6, 23.5% of black and 29.0% of nonblack respondents had tried smoking ($\chi^2_1 = 4.50$, $p = 0.03$). In the logistic regression model, smoking initiation was predicted by female gender, and higher levels of conduct-disordered symptoms, sensation-seeking, and friend smoking (Table 2). The quadratic effect of BMSE on nonblack teens was not significant so it was dropped from the model. Joint 2-df chi-square tests of the linear and quadratic effects for black teen BMSE, black teen MMSE, and nonblack teen MMSE were all significant ($\chi^2_2 = 6.29, 10.35, \text{ and } 26.81$, p 's = 0.043, 0.006, and < 0.001, respectively). Plots of predicted probabilities for black teens generated by this model are presented in Figure 1.

Among black youth, MMSE was unrelated to smoking initiation (except at the very highest levels of exposure), whereas BMSE was significantly related to smoking initiation (an effect that became weaker for those with the highest levels of this exposure). For black teens, effects of BMSE can be compared to MMSE in the part of the distribution common to both (i.e., 0–391 exposures). Among black teens, the linear trend between exposure and initiation was significantly stronger (at $p = 0.05$) for BMSE than MMSE for exposure levels ranging from 0 to 216; dropping the distinction between BMSE and MMSE (i.e., using the sum of these exposures as a predictor) for this group significantly degraded model fit ($\chi^2_2 = 7.79$, $p = 0.02$). Among all other youth, both MMSE and BMSE were significant predictors of initiation (Figure 2) and their linear trends were not significantly different anywhere in the overlapping range of exposure (0–391); dropping the distinction between BMSE and MMSE (i.e., using the sum of these exposures as a predictor) for this group did not significantly degrade model fit ($\chi^2_1 = 1.71$, $p = 0.19$).

Discussion

The current results reveal that among black youth in this sample, the likelihood of smoking initiation is significantly and uniquely predicted by exposure to BMSE, and that the dose–response curve is significantly different than that for MMSE. Among other adolescents, both types of exposure significantly predict trying smoking, and the forms of the relationships are indistinguishable. The limited relationship between movie smoking exposure and smoking initiation of black teens observed in prior research may be partly explained by failure to adequately account for exposure to same-race risk portrayals. In the current analysis, among black youth, increasing BMSE (from the 5th to the 95th percentile, 46 to 391) is associated with a 2.6-fold increase in the probability of smoking initiation. Among nonblack youth, increasing exposure to mainstream movie smoking (from the 5th to the 95th percentile, 30–990 occurrences) is associated with a 2.8-fold increase in the probability of smoking initiation.

A limitation of the current study is that students were not asked about the extent to which they psychologically engage with black-oriented and mainstream media. However, extant research indicates that racial group membership (as a proxy for racial identity) is associated with media choices; further, extensive research using social cognitive theory²² demonstrates that media effects are stronger when viewers identify with characters and consider them relevant models.

Among nonblack respondents, BMSE and MMSE were both associated with increased risk of initiation, with ORs similar to those observed in prior research.^{14,15} Only speculation can be offered to explain why BMSE would predict smoking initiation among these teens. Recall that a large proportion of nonblack respondents had seen no black-oriented movies; it may be that those (mostly white teens) who go to black-oriented movies do so for reasons

that might make them receptive to messages in those movies (e.g., having black friends, appreciation or appropriation of black culture); analyses considering adolescents in their social contexts would help clarify these results. Conclusions here about exposure to identity-relevant media are limited to this particular health behavior. Researchers have documented racial differences in the associations between same-race media and health-related outcomes. For example, more exposure to TV in general (which features predominantly white characters) may improve white boys' self-esteem,³⁴ whereas stronger identification with popular black characters may be protective for black adolescents' self-esteem.²⁵

Limitations

The current study provides a new, elaborated view of the relationship between smoking initiation and subtypes of movie smoking exposure, with some limitations. First, the measure of smoking initiation, while allowing evaluation of trying smoking, does not speak to whether BMSE or MMSE relate to continued smoking in the future. Second, although an additional sample of black youth were recruited, the sample frame comprised census tracts with relatively high black populations. Therefore, these relationships may not generalize to black youth who live in neighborhoods where there are few black contacts.

Third, except for the new sample of black youth, the respondents were participants in prior waves of the study not lost to follow-up. By W5, differential attrition resulted in a sample that no longer reflects a representative U.S. population. Thus, current results should not be generalized to the most at-risk youth in the U.S., who are likely under-represented in this sample (although the effects of movie smoking exposures tend to be larger for youth who are less at-risk,¹⁹ suggesting that inclusion of higher-risk youth would diminish the effect sizes observed).

The current data do not contain information on parent smoking status, precluding replication of research using that moderator (which shows stronger effects among children whose parents do not smoke). Fourth, the relatively small numbers of Hispanic youth and youth who did not identify as exclusively black or white precludes targeted examination of exposures among these teens. There were also few, if any, movies that could be construed as targeted specifically toward these audiences. It remains to be seen whether measures of exposure to smoking in popular movies provide an adequate assessment of exposure to, and effects of, smoking imagery for these populations; future research seems warranted.

Conclusion

The current findings suggest a relationship between media exposures and smoking outcomes among black youth, and speak to the critical importance of considering demographic differences in media consumption practices and resulting differences in exposure. Indeed, examining exposure to media that are predominantly consumed by black audiences demonstrates that this exposure is significantly associated with a specific health risk behavior, a finding that parents, practitioners, and producers should be aware of.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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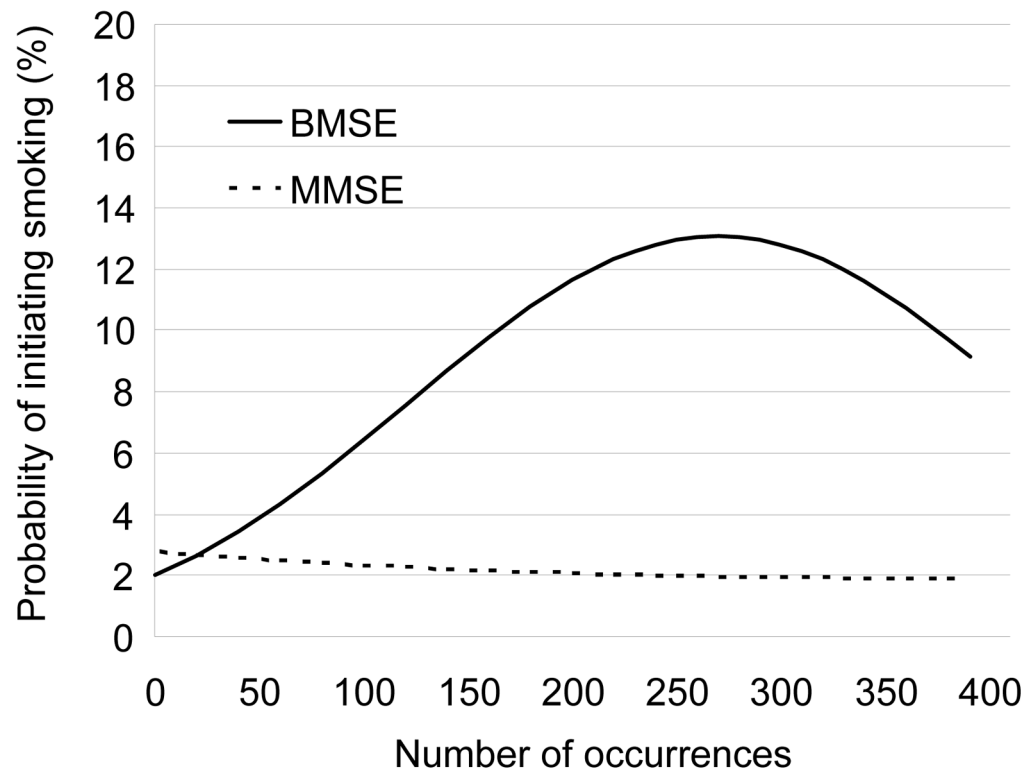


Figure 1. Predicted probability of smoking initiation among black adolescents as a function of BMSE and MMSE
BMSE, black-oriented movie smoking exposure; MMSE, mainstream movie smoking exposure

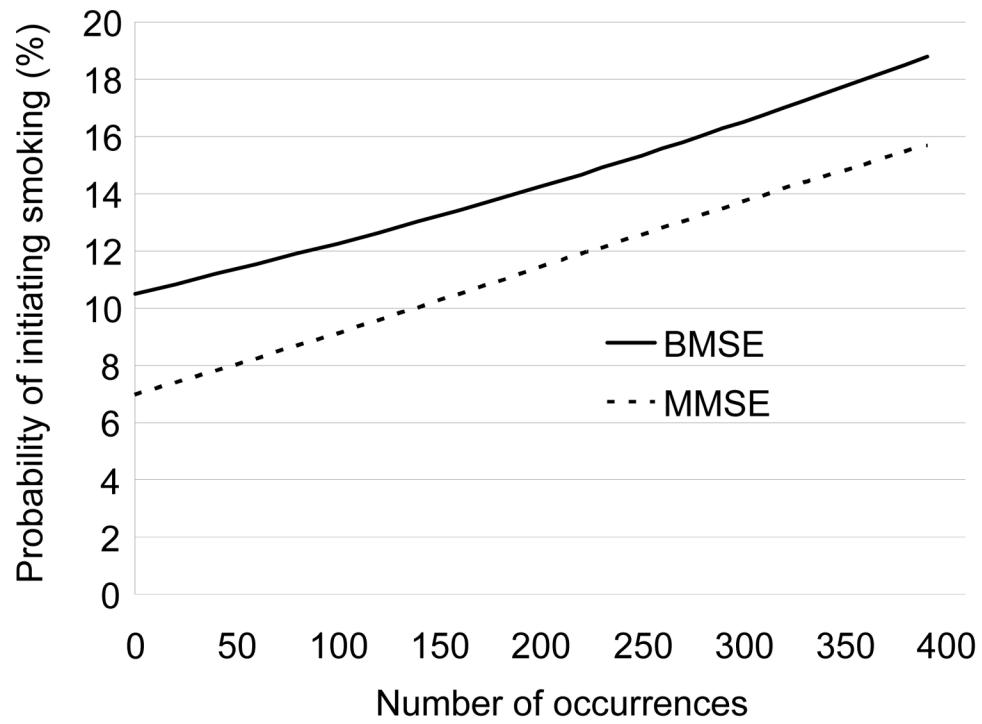


Figure 2. Predicted probability of smoking initiation among nonblack adolescents as a function of BMSE and MMSE
BMSE, black-oriented movie smoking exposure; MMSE, mainstream movie smoking exposure

Table 1

Descriptive Statistics by group

	Black adolescents (n=379)		All other adolescents (n=1443)	
	M (SD)	Range	M (SD)	Range
Age (years)	15.46 (1.17)	13–18	15.52 (1.39)	13–19
SES (standardized) ^a	-0.17 (0.90)	-1.98–2.01	0.16 (0.84)	-2.06–1.67
Hours of TV per day ^a	2.48 (1.01)	0–4	1.75 (0.92)	0–4
Friends smoke	1.47 (0.58)	1–3	1.46 (0.55)	1–3
Adult responsiveness	9.00 (3.19)	0–12	9.23 (2.92)	0–12
Adult monitoring	10.59 (1.90)	3–15	10.74 (1.84)	3–15
Conduct-disorder symptoms ^a	3.09 (2.48)	0–15	2.57 (2.29)	0–13
Sensation-seeking ^a	10.79 (2.69)	5–19	11.28 (2.77)	5–20
MMSE	456.01 (323.47)	0–1781	394.61 (304.39)	0–1862
BMSE	262.29 (111.26)	0–391	76.30 (96.10)	0–391

^aDifferences between groups are significant, $p < 0.001$.

BMSE, black-oriented Movie Smoking Exposure; MMSE = mainstream Movie Smoking Exposure.

Table 2

Logistic Regression Predicting Smoking Initiation

Characteristic	Odds Ratio (95% CI)
Black Teen	0.09 (0.01,0.60)
Not-Black Teen	0.13 (0.02,0.84)
Gender ^a	
Male	Referent
Female	1.34 (1.07,1.69)
SES (standardized) ^b	0.82 (0.53,1.26)
Has TV in Bedroom ^a	
No	Referent
Yes	1.04 (0.82,1.32)
TV Hours per Day ^c	0.91 (0.55,1.49)
Age ^b	0.73 (0.51,1.05)
Peer Smoking ^c	2.21 (1.45,3.35)
Sibling Smoking ^a	
No	Referent
Yes	1.12 (0.81,1.56)
Adult Responsiveness ^b	0.96 (0.69,1.34)
Adult Monitoring ^b	0.92 (0.60,1.42)
Conduct Disorder Symptoms ^b	1.89 (1.23,2.90)
Sensation Seeking ^b	3.40 (2.14,5.41)
Black Teens	
Black-oriented MSE Linear	4.61 (1.22,17.4)
Black-oriented MSE Quadratic	0.01 (0.00,0.67)
Mainstream MSE Linear	0.68 (0.30,1.50)
Mainstream MSE Quadratic	1.58 (1.04,2.38)
All other Teens	
Black-oriented MSE Linear	1.99 (1.15,3.45)
Mainstream MSE Linear	2.50 (1.69,3.71)
Mainstream MSE Quadratic	0.73 (0.59,0.89)

MSE = Movie Smoking Exposure. Coefficients for Black Teen and Not-Black Teen represent intercepts for each group.

^aDichotomous variable; reference group as indicated.

^bModeled as a continuous variable; trimmed at approximately the 5th and 95th percentile values to avoid possible distortion due to outliers and estimates are scaled to reflect the difference in initiation associated with moving from the 5th to the 95th percentile.

^cOrdered categorical variable; estimates are scaled to contrast the lowest level with the highest.

Significant *p* values are bolded. Analysis excludes 519 participants lost to follow up and 35 participants with missing data on covariates.