

## Original Investigation

# The Role of Family Influences on Adolescent Smoking in Different Racial/Ethnic Groups

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## Abstract

**Introduction:** Although differing levels of family influences may explain some of the varying racial/ethnic trends in adolescent smoking behavior, clarification of which influences are protective against smoking may aid in the development of future ethnic-specific smoking prevention interventions. We sought to identify and compare the association of family influences on adolescent smoking among Black, Hispanic, and White adolescents in a cross-sectional national sample.

**Methods:** Data from 6,426 parent-child dyads from Round 1 of the National Survey of Parents and Youth were analyzed. The association of family influences with ever-smokers and recent smokers was evaluated. Multinomial logistic regression using SUDAAN software was used.

**Results:** While all measures of family influences except for parent-adolescent activities and intention to monitor were significantly protective against recent smoking and ever smoking among Whites, ethnic-specific family influence predictors of smoking were found in Blacks and Hispanics. Higher parental monitoring, higher intention to monitor, and higher connectedness were protective among Hispanics, while higher parental punishment and favorable attitude toward monitoring were protective against smoking among Blacks. For family influences significantly associated with protection against smoking, consistently greater protection was afforded against recent smoking than against ever smoking.

**Conclusions:** Higher levels of family influences are protective against smoking among all racial/ethnic groups. There are consistencies in family influences on youth smoking; however, there may be specific family influences that should be differentially emphasized within racial/ethnic groups in order to protect against smoking behavior. Our results offer insight for designing

strategies for preventing smoking in youth of different racial/ethnic backgrounds.

## Introduction

Tobacco use remains the single leading preventable cause of disease and death in the United States. Despite recent decreases in adolescent smoking rates, 23.9% of high-school students reported current use of any tobacco product and 17.2% reported current use of cigarettes in 2009 (Centers for Disease Control and Prevention, 2010). Patterns of adolescent smoking differ among racial/ethnic groups. Whites show the highest prevalence of smoking, followed by Hispanics and Black youth (Ellickson, Orlando, Tucker, & Klein, 2004; Griesler & Kandel, 1998; Kandel, Kiros, Schaffran, & Hu, 2004). Whites start smoking at an earlier age and are more likely to persist in smoking than minority youths (Griesler & Kandel, 1998; Griesler, Kandel, & Davies, 2002; Kandel et al., 2004; Landrine, Richardson, Klonoff, & Flay, 1994; Nelson et al., 1995). In an effort to understand which factors predict adolescent smoking initiation, researchers have examined the role of sociodemographics, prosmoking influences, and family influences on smoking behavior in youth of diverse racial/ethnic groups. Findings are mixed, but some studies have reported a greater number of common predictors rather than ethnic-specific predictors of adolescent smoking initiation and progression (Griesler et al., 2002; Kandel et al., 2004). For example, low family income, younger age, low parental education, and living in a single-parent household have been found to predict smoking initiation among White, Black, and Hispanic youth (Chassin, Presson, Sherman, & Edwards, 1992a, 1992b; Kandel et al., 2004; Waldron & Lye, 1990). However, prosmoking influences may be associated with smoking behavior by racial/ethnic group. Maternal smoking, peer smoking, and approval for smoking pose greater risk for smoking initiation among Whites than minorities (Catalano et al., 1992; Chassin, Presson,

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Sherman, & Edwards, 1990; Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999; Griesler et al., 2002), although peer smoking has been found to be highly significant across all three racial/ethnic groups (Kandel et al., 2004).

Investigators have reported that the presence of stronger family factors such as monitoring, parent–adolescent closeness, and consistent discipline is protective against initiation even when there are high levels of risk factors for smoking initiation (Skinner, Haggerty, & Catalano, 2009), particularly those found in minority youth. Lack of parent–adolescent closeness, inconsistent discipline, and ineffective monitoring has been associated with smoking behavior in White, Black, and Hispanic youths (Catalano et al., 1992; Chilcoat, Dishion, & Anthony, 1995; Clark et al., 1999; Ellickson et al., 2004; Griesler et al., 2002; Headen, Bauman, Deane, & Koch, 1991; Kandel et al., 2004; Mermelstein, 1999).

Recently, antismoking parenting practices have been shown to decrease youth smoking. In undifferentiated ethnic samples, parenting practices such as setting rules about smoking and discussing smoking-related topics (Dornelas et al., 2005; Harakeh, Scholte, Vermulst, de Vries, & Engels, 2004; Jackson & Dickinson, 2006; Sargent & Dalton, 2001; Siddiqui, Mott, Anderson, & Flay, 1999) have been shown to be associated with decreased youth smoking, even when the parent(s) currently smokes (Jackson & Henriksen, 1997; Sargent & Dalton, 2001). Some parenting practices may protect against smoking initiation in different racial/ethnic groups. Recently, Skinner et al. (2009) demonstrated that Black adolescents are protected against smoking by the presence of clear parental guidelines and consequences about substance use in the home in comparison with White youth. Others have reported that the presence of stronger religious ties and greater parental self-efficacy in Black families is important in preventing smoking initiation (Clark et al., 1999; Ellickson, Perlman, & Klein, 2003; Skinner et al., 2009). Stronger family attachment and ties, communication, and parental respect have been shown to be protective against smoking initiation in Hispanics compared with Whites (Ellickson & Morton, 1999; Ellickson et al., 2003; Freeberg & Stein, 1996; Headen et al., 1991; Hunter, Croft, Vizelberg, & Berenson, 1987). However, more research is needed to examine the protective effects of other antismoking practices and family influences, which may protect against smoking in ethnically diverse samples (Simons-Morton, 2004; Skinner et al., 2009) in preparation for family-based smoking prevention interventions.

In an effort to better understand which family influences and antismoking parenting practices are protective against adolescent smoking behavior in different racial/ethnic groups, we examined the National Survey of Parents and Youth (NSPY; Westat, 2006). The NSPY contains several family influences that may protect against smoking that have not been evaluated in non-White ethnic samples. We were specifically interested in determining if there were family influences that were protective against smoking in more than one racial/ethnic group, which can guide future parent-based smoking prevention interventions in diverse youth samples. Thus, the purpose of our research was to determine the sociodemographics, prevalence of smoking, and the relative impact of family influences, antismoking parenting practices, and prosmoking influences on smoking behavior among cross-sectional cohorts of Black, Hispanic, and White youth using Round 1 of the NSPY. We hypothesized that high

levels of family influences and antismoking parenting practices will be protective against ever smoking and recent smoking in these three racial/ethnic adolescent cohorts.

## Methods

### Sample and Measures

#### Sample

Data are from the Restricted Use Files (RUF) of the NSPY, a longitudinal, nationally representative household-based survey of adolescent and parent dyads that was conducted in 90 locations across the United States. A multistage sampling design was used to provide a representative cross-section of America's 9- to 18-year-old youth. One or two youth and one parent were randomly selected from each eligible household. The analytic strategy employing the weighting procedure took the sampling design into account. Detailed information about the NSPY sampling and survey methodology can be found elsewhere (Westat, 2003, 2006).

Inclusion criteria for our analysis were (a) youth 9–18 years of age and a parent who answered the Round 1 NSPY survey (collected November 1999–June 2001;  $n = 7,620$ ); (b) youth who were self-identified as White/non-Hispanic ( $n = 5,053$ ), Black/non-Hispanic ( $n = 1,160$ ), or Hispanic ( $n = 1,126$ ). Due to very low sample sizes (<0.4%), Asian-American youth and youth of other racial/ethnic groups were not included; (c) dyads who answered the query regarding their smoking status ( $n = 7,267$ ); and (d) dyads with no missing responses to the family influence and antismoking parenting measures evaluated for this study ( $n = 6,426$ ). The analysis sample represents 84.3% of the 7,620 youth interviewed in Round 1 with 51.1% male; 68.9% White, 16.1% Black, and 15.0% Hispanic; and 29.9% nine- to eleven-year-olds, 20.5% twelve- to thirteen-year-olds, and 49.6% aged 14–18 years (weighted percentages). Of the sample that was excluded, 18% were missing data on family influence and antismoking parenting measures, and 10%–30% were missing data on covariates, such as parental smoking status and income. Mean age (*SEM*) of the excluded and analytic sample was 12.5 (0.1) and 13.4 (0.03), respectively; there were 9.8% current youth smokers in the analytic sample and 10.5% in the excluded sample.

#### Assessment

The NSPY questions were chosen to resemble questions from national surveys, such as Monitoring the Future and the National Survey on Drug Use and Health. Parental consent and youth assent were obtained, and data analysis activities were approved by our institutional review board.

#### Measures

**Outcome variable.** The outcome variable of interest was smoking status. Responses to questions regarding youth smoking behavior for the NSPY were combined to create a three-point index of smoking broadly based on categories used by Bernat, Erickson, Widome, Perry, and Forster (2008) and Leatherdale (2008). The categories were (a) never-smoker (73.3%): someone who has never smoked, (b) ever-smoker (16.9%): someone who smoked some or regularly but not in the last thirty days, and (c) recent smoker (9.8%): someone who smoked in the last thirty days.

## Family influences on adolescent smoking

**Socioeconomic variables.** Race/ethnicity was defined by adolescent self-report; youth were categorized as Black/non-Hispanic, White/non-Hispanic, and Hispanic. Adolescent age was derived from the respondent's date of birth. Gender was noted by the interviewer. Highest parent education level, annual income, and one- or two-parent household were obtained by parent self-report.

**Tobacco variables.** Parents were classified as smokers if they reported that they have smoked in the last thirty days. Time with smoking peers was assessed by asking: "How many times have you spent with friends who smoke cigarettes in the last 7 days?" This was categorized as never (0 days) and ever (once or more). Age at first smoking experience was self-reported by youth.

**Family influences and antismoking parenting.** Measures of family influence and antismoking parenting (referred to

collectively as family factors) were evaluated, and composite scores were created based on construction by NSPY (Hornik et al., 2003; Orwin et al., 2005) for connectedness, activities, monitoring, intention to monitor, and attitudes toward monitoring. Antismoking parenting measures were rules about smoking and punishment for both parent and youth and likelihood of punishment, belief about child smoking, belief about future use, and parent attitude about their personal tobacco use. See Table 1 for sample questions. Internal consistency was checked for constructed measures with more than one question per measure (Cronbach's alpha).

## Statistical Methods

All analyses were based on using weighted data sampling techniques. The use of weighted sample data takes into account the disproportionate representation of certain subgroups in the

**Table 1. Family Influence Variables to be Assessed Within the NSPY Database**

	Youth/parent report	Sample questions	Number of questions	Cronbach's alpha
<b>Family influences</b>				
Parent-adolescent connectedness	Y	In the last 30 days, I really enjoyed being with my parents/caregivers.	3	.80
Parent-adolescent connectedness	P	In the last 30 days, I really enjoyed being with my child.	3	.78
Parent-adolescent activities	P	In the past week, did you do any projects or activities with your child at home?	2	.88
Parental monitoring	Y	How often does at least one of your parents know what you are doing when you are away from home?	2	.78
Parental monitoring	P	How often do you know what your child is doing when they are away from home?	5	.80
Parent intention to monitor	P	How likely is it that you will: Limit the time that (child) spends with other children without adult supervision, in the next 6 months?	5	.83
Attitudes toward monitoring	P	Closely monitoring (child's) daily activities is: extremely good, pleasant, important.	3	.90
<b>Antismoking parenting</b>				
Rules about smoking	Y	In the last 6 months, have you and either of your parents talked about family rules or expectations about smoking cigarettes?	1	N/A
Perceived parental punishment	T	If one of your parents knew that you used tobacco or alcohol, how likely is it that he or she would punish you in some way?	1	N/A
Parent likelihood of punishment	P	If you knew that (child) used tobacco or alcohol, how likely is it that you would discipline (child) or provide some type of consequence?	1	N/A
Parent belief about child smoking activity	P	How many times, if any, do you think (child) has smoked cigarettes during the last 12 months?	1	N/A
Parent belief about future use	P	How likely is it that (child) will use cigarettes, even once or twice over the next 12 months?	1	N/A
Parent attitude about their personal tobacco use	P	Whether or not I use tobacco will influence whether or not my child will smoke cigarettes within the next 12 months.	1	N/A

*Note.* N/A = not applicable—only one question per variable. P = parent report; T = only teenager's records were available from this youth file; Y = youth report.

raw sample and account for varying selection probabilities (Westat, 2006). In addition, all the weights included have been adjusted for differential response rates and have been calibrated (poststratified) to independent estimates of population counts. These adjustments are designed to compensate for differences between the weighted sample distributions and the corresponding population distributions that result from differential nonresponse and undercoverage (Hornik et al., 2003; Orwin et al., 2005). These adjustments are taken into account in the sample weights provided in the NSPY-RUF dataset.

We estimated the associations of family factors with non-smokers, ever-smokers, and recent smokers. SUDAAN software was used to account for the complex survey design, and weighting was accounted for by using the Jackknife method as suggested by NSPY. Chi-square or analysis of variance was used to examine bivariate differences between groups for demographics and independent variables of interest. Multinomial logistic regression was used to examine the association between smoking status and family factors; the never smoking group was used as the reference group. Initial models examined the interaction of race/ethnicity with family factors, and then, race/ethnicity models were examined. The proportional odds assumption was checked before fitting each model. The covariates controlled in all analyses were age, gender, peer smoking, parental education and smoking history, and family income and structure as these were considered clinically important covariates (Ellickson et al., 2004; Griesler & Kandel, 1998), a priori. Adolescent age in years was entered in the model as a continuous variable.

## Results

### Sociodemographics and Correlates of Youth Smoking by Race/Ethnicity

There was no statistically significant difference in gender for youth smoking status overall ( $p = .4$ ) or by race/ethnicity group

nor were there differences in age of first smoking experience by race/ethnicity group. Significant race/ethnicity differences appeared among all other covariates (Table 2). Compared with Black and Hispanic parents, a higher proportion of Whites had attended college, had a higher annual income, and had a two-parent household. The rates of prosmoking influences such as parental current smoking and time spent with smoking peers were higher in Whites.

### Distribution of Youth Concurrent Smoking Status and Family Factors by Race/Ethnicity

Table 3 shows the distribution of our outcome variable of youth smoking status and the independent predictors by racial/ethnic group. There were statistically significant differences in smoking status across the three racial/ethnic groups. Distribution of smoking was significantly different ( $p < .0001$ ) among the groups: Recent smoking in Whites (12%) was higher than among Hispanics (5.5%) and Blacks (3.8%). Significant racial/ethnic differences appeared among all of the family factors except for intention to monitor (Parent [P]) and rules about smoking (Youth [Y]).

### Interaction of Family Factors and Race/Ethnicity

We initially tested the interaction of race/ethnicity and each family influence measure to see if the effect of family influence measures on adolescent smoking varies differentially by race/ethnicity; there were no statistically significant interactions. However, the race/ethnicity main effects for adolescent smoking were statistically significant, and since we were specifically interested in differences by race/ethnicity, we chose to further examine the association of adolescent smoking and family influence measures separately by race/ethnicity.

**Table 2. Demographics and Covariates by Race/Ethnicity Among 9- to 18-Year-Olds, NSPY-RUF, Round 1 (n = 6,426)**

	White, N = 4,491 (68.9%)	Black, N = 984 (16.1%)	Hispanic, N = 951 (15.0%)	p value (chi-square test)
Gender (male)	2,338 (51.4%)	481 (48.9%)	508 (52.5%)	.38
Current age (in years)	13.4 (0.04) <sup>a</sup>	13.3 (0.07)	13.2 (0.08) <sup>b</sup>	.0009
Parent education (college or higher)	2,673 (59.3%) <sup>a</sup>	424 (43.3%) <sup>b</sup>	284 (31.0%) <sup>c</sup>	<.0001
Family structure (two parents)	3,519 (78.7%) <sup>a</sup>	384 (41.3%) <sup>b</sup>	639 (67.2%) <sup>c</sup>	<.0001
Annual income, \$mean (SEM)	57,298 (986) <sup>a</sup>	33,207 (1,180) <sup>b</sup>	35,720 (1,407) <sup>b</sup>	<.0001
Parental smoking history <sup>d</sup>				<.0001
Never	1,024 (22.5%)	360 (38.9%)	449 (49.6%)	
Ever	2,206 (48.3%)	376 (36.4%)	308 (29.6%)	
Current	1,261 (29.2%)	248 (24.7%)	194 (20.8%)	
Time with friends who smoke	1,206 (34.4%) <sup>a</sup>	189 (22.9%) <sup>b</sup>	203 (25.8%) <sup>b</sup>	<.0001
Age at first smoking experience (in years)	12.4 (0.1)	12 (0.2)	12.6 (0.2)	.1558

Note. Data presented as raw N (weighted %) or weighted mean (SEM).

<sup>a</sup>Different from “b” and “c” at adjusted  $p < .05$ .

<sup>b</sup>Different from “a” and “c” at adjusted  $p < .05$ .

<sup>c</sup>Different from “a” and “b” at adjusted  $p < .05$ .

<sup>d</sup>Distribution of smoking history is different between Whites, Blacks, and Hispanics at adjusted  $p < .05$ .



**Table 3. Outcome Variable and Independent Predictors by Race/Ethnicity Among 9- to 18-Year-Olds, NSPY-RUF, Round 1**

	White, <i>N</i> = 4,491 (68.9%)	Black, <i>N</i> = 984 (16.1%)	Hispanic, <i>N</i> = 951 (15.0%)	<i>p</i> value
<b>Outcome variable</b>				
Current smoking status <sup>a</sup>				<.0001
Never	3,493 (70.6%)	818 (80.6%)	771 (77.8%)	
Ever	629 (17.3%)	137 (15.6%)	129 (16.7%)	
Recent	369 (12.0%)	29 (3.8%)	51 (5.5%)	
<b>Independent predictors</b>				
Family influences (range of each score)	<i>M</i> (95% <i>CI</i> )	<i>M</i> (95% <i>CI</i> )	<i>M</i> (95% <i>CI</i> )	
Parent-adolescent connectedness (P; 0-3)	1.49 (1.45, 1.54) <sup>b</sup>	1.58 (1.47, 1.65)	1.60 (1.52, 1.66) <sup>f</sup>	.01
Parent-adolescent connectedness (Y; 0-3)	0.94 (0.89, 0.99) <sup>b</sup>	1.34 (1.25, 1.42) <sup>f</sup>	1.20 (1.14, 1.28) <sup>d</sup>	<.0001
Parent-adolescent activities (P; 0-6)	2.18 (2.13, 2.24) <sup>b</sup>	2.08 (1.93, 2.15)	1.97 (1.85, 2.08) <sup>f</sup>	.007
Parental monitoring (P; 0-3)	2.10 (2.06, 2.15) <sup>b</sup>	1.88 (1.81, 1.96) <sup>f</sup>	2.01 (1.91, 2.09)	<.0001
Parental monitoring (Y; 0-3)	1.32 (1.27, 1.38) <sup>b</sup>	1.16 (1.03, 1.26) <sup>f</sup>	1.30 (1.09, 1.35)	.016
Parent intention to monitor (P; -2 to 2)	1.44 (1.47, 1.51)	1.40 (1.41, 1.49)	1.38 (1.41, 1.5)	.1
Parent attitudes toward monitoring (P; 1-7)	6.23 (6.2, 6.27) <sup>b</sup>	6.35 (6.27, 6.4) <sup>c</sup>	6.42 (6.36, 6.5) <sup>c</sup>	<.0001
Antismoking parenting (range of each score)				
Rules about smoking (Y; 1-2)	1.43 (1.4, 1.44)	1.41 (1.36, 1.45)	1.37 (1.32, 1.41)	.15
Parent punishment (P; 1-5)	4.67 (4.64, 4.7) <sup>b</sup>	4.65 (4.58, 4.72)	4.55 (4.38, 4.53) <sup>f</sup>	.006
Parent punishment (T; 1-5)	4.16 (4.1, 4.21) <sup>b</sup>	4.30 (4.26, 4.37) <sup>f</sup>	4.29 (4.18, 4.42)	.026
Parent attitude about personal use (P; 1-5)	3.84 (3.78, 3.9) <sup>b</sup>	3.31 (3.11, 3.43) <sup>f</sup>	3.47 (3.33, 3.54) <sup>f</sup>	<.0001

Note. Data presented as raw *N* (weighted %), or weighted *M* (*SEM*). P = parental file; T = only teenager's records were available from this youth file; Y = youth file.

<sup>a</sup>Distribution of current smoking status in Whites is different from distribution of current smoking in Blacks and Hispanics at adjusted *p* < .05.

<sup>b</sup>Different from "b" and "c" at adjusted *p* < .05.

<sup>c</sup>Different from "a" and "c" at adjusted *p* < .05.

<sup>d</sup>Different from "a" and "b" at adjusted *p* < .05.

### Association of Family Factors on Smoking Status by Race/Ethnicity

Table 4 shows adjusted odds ratios (*AOR*) and 95% *CI*s for family factors and prosmoking influences for each racial/ethnic group separately to illustrate patterns in protective or risk factors on smoking status. *AOR* were controlled for age, gender, parental education, parental smoking history, income, family structure, and peer smoking. For completeness, unadjusted odds ratios (*UOR*) were also examined. Interpretation of these *UOR* was similar to that of the adjusted value; thus, they are not presented. Among the covariates, of particular interest are the odds ratios (*OR*) associated with peer smoking. These *OR* (95% *CI*) for recent smoking range up to 30.1 (18.1, 50.0) for White youth, 14.4 (5.2, 39.4) for Black youth, and 25.3 (8.4, 76.5) for Hispanic youth. Similarly, for ever smoking, *OR* (95% *CI*) for peer smoking range up to 3.6 (2.8, 4.7) for White youth, 3.0 (1.9, 4.8) for Black youth, and 3.0 (1.8, 5.1) for Hispanic youth. Despite the strong influence of peer smoking, our findings support our hypothesis that higher levels of family factors are protective against both ever smoking and recent smoking in all racial/ethnic groups. All family influence variables were protective against recent smoking in White youth. For Blacks, connectedness (P), monitoring (P), and attitudes toward monitoring (P) were significantly protective against recent smoking. For Hispanics, connectedness (Y), monitoring, and intention to monitor were significantly protective against recent smoking. Of the anti-smoking parenting measures, only parental punishment (Y) was protective against both recent smoking and ever smoking in

Whites and Blacks. Rules about smoking and parental attitudes about personal use were not significantly protective for any race/ethnicity.

We were interested in determining if there were protective influences that crosscut to more than one racial/ethnic group. Two family influence measures were significantly protective among all three groups for ever smoking or recent smoking. Higher connectedness (Y) significantly lowered the odds of being an ever-smoker compared with being a never-smoker by 20% in Whites and by 40% in Blacks and Hispanics. Similarly, higher monitoring (P) lowered the odds of being a recent smoker by 30% in Whites and by 50% in Hispanics and Blacks. Three family influence measures and one antismoking parenting measure: higher connectedness (P), monitoring (P), and attitudes toward monitoring (P), significantly lowered the odds of being a recent smoker and to a varying degree an ever-smoker in both Whites and Blacks. Monitoring (Y), intention to monitor (P), and punishment (P) significantly lowered the odds of being a recent smoker in both Whites and Hispanics. Of note, there was significant correlation,  $\geq .3$ , within the monitoring variables, specifically, between parental intention to monitor and parental attitude toward monitoring ( $r = .45$ ), parental intention to monitor and parental punishment ( $r = .32$ ), parental intention to monitor and parental monitoring ( $r = .45$ ), parental monitoring and parental attitude toward monitoring ( $r = .40$ ), parental connectedness and parental attitude toward monitoring ( $r = .34$ ), and youth connectedness and youth monitoring ( $r = .38$ ).

**Table 4. Adjusted Odds Ratio Estimates for Family Influences, Antismoking Parenting, and Prosmoking Influences on Concurrent Smoking Status Among 9- to 18-Year-Olds, NSPY-RUF, Round 1<sup>a</sup>**

	White				Black				Hispanic			
	Recent smoker <sup>b</sup>		Ever-smoker		Recent smoker		Ever-smoker		Recent smoker		Ever-smoker	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<b>Family influences</b>												
Parent-adolescent connectedness (P)	0.7	(0.62, 0.87)	0.8	(0.74, 0.92)	0.6	(0.4, 0.9)	0.9	(0.67, 1.11)	0.7	(0.41, 1.14)	0.8	(0.58, 0.99)
Parent-adolescent connectedness (Y)	0.8	(0.64, 0.93)	0.8	(0.72, 0.92)	1.1	(0.67, 1.72)	0.6	(0.5, 0.81)	0.5	(0.33, 0.77)	0.6	(0.47, 0.87)
Parent-adolescent activities (P)	0.8	(0.71, 0.94)	0.9	(0.85, 1.04)	1.2	(0.84, 1.6)	0.9	(0.78, 1.06)	0.7	(0.46, 1.01)	1.2	(1.03, 1.38)
Parental monitoring (P)	0.7	(0.57, 0.8)	0.8	(0.71, 0.93)	0.5	(0.23, 0.88)	0.9	(0.68, 1.1)	0.5	(0.3, 0.77)	0.9	(0.67, 1.19)
Parental monitoring (Y)	0.6	(0.49, 0.74)	0.7	(0.61, 0.83)	0.7	(0.38, 1.15)	0.8	(0.67, 0.98)	0.5	(0.37, 0.78)	0.7	(0.56, 0.9)
Parent intention to monitor (P)	0.7	(0.49, 0.92)	0.9	(0.72, 1.14)	0.4	(0.18, 1.01)	0.9	(0.63, 1.27)	0.4	(0.23, 0.69)	0.7	(0.51, 0.94)
Parent attitudes toward monitoring (P)	0.6	(0.47, 0.7)	0.8	(0.65, 0.88)	0.5	(0.29, 0.85)	0.7	(0.53, 0.86)	0.7	(0.44, 1.14)	0.8	(0.54, 1.08)
<b>Antismoking parenting</b>												
Rules about smoking (Y)	0.7	(0.49, 1.02)	1	(0.76, 1.33)	0.8	(0.32, 2.04)	1.5	(0.91, 2.34)	0.7	(0.29, 1.69)	1.1	(0.54, 2.14)
Parent punishment (P)	0.7	(0.61, 0.86)	1	(0.81, 1.14)	0.7	(0.39, 1.24)	0.8	(0.56, 1.01)	0.7	(0.45, 0.93)	1.1	(0.82, 1.4)
Parent punishment (T) <sup>b</sup>	0.5	(0.44, 0.6)	0.8	(0.67, 0.88)	0.7	(0.48, 0.9)	0.7	(0.56, 0.82)	0.9	(0.6, 1.26)	0.9	(0.71, 1.2)
Parent attitude about personal use (P)	1.1	(0.93, 1.21)	1.1	(0.95, 1.17)	0.7	(0.52, 1.03)	1.1	(0.93, 1.25)	1	(0.65, 1.41)	1	(0.8, 1.14)

Note. Bold print signifies that OR was statistically significant at  $p < .05$ . OR = odds ratio; P = parental file; T = only teenager's records were available from this youth file; Y = youth file.  
<sup>a</sup>Never-smoker is used as the reference group. All analyses were controlled for age, gender, highest parent education, annual family income, family structure, parental smoking status, and time spent with friends who smoke.

<sup>b</sup>Recent smoker.

### Discussion

Recent research supports the premise that family factors are protective against youth smoking (Dornelas et al., 2005; Griesler & Kandel, 1998; Jackson & Henriksen, 1997; Sargent & Dalton, 2001; Siddiqui et al., 1999; Simons-Morton, Chen, Abrams, & Haynie, 2004). Much of this research is constrained by the evaluation of a limited range of family factors in samples that were not ethnically diverse. The aims of this study were to determine the sociodemographics, prevalence of smoking, and relative impact of prosmoking influences and family factors, some of which have not been previously evaluated, on concurrent smoking behavior among cross-sectional cohorts of Black, Hispanic, and White youth using NSPY data.

The following major patterns in the rates and impact of family factors on smoking behavior were noted: (a) Recent smoking rates were higher in White youth compared with Hispanic and Black youth. (b) Black and Hispanics had a higher proportion of risk factors known to be associated with smoking, but the prosmoking influences of parental smoking and peer smoking were higher in Whites. (c) All family influence variables were protective against recent smoking in Whites. (d) Controlling for other factors, higher levels of family influences and parental punishment were protective against ever smoking and recent smoking in all three racial/ethnic groups. We had initially thought that there would be varying family influence on adolescent smoking by race/ethnicity and tested this by examination of the interaction; however, the interaction terms were not significant. This is a very important finding, which has an impact in the development of future youth smoking interventions. This result suggests that such prevention interventions may, in fact, not need to be tailored differentially by youth racial/ethnic groups. As we chose to examine the adolescent smoking separately by race/ethnicity, we were able to see that there were indeed some common family influence variables, albeit to varying degrees. It is very important to note that these family influences were significant after controlling for age, gender, parental education, family income and structure, parental smoking, and peer smoking. As noted in the results, time spent with peers who smoke can increase the odds of adolescent ever smoking up to fourfold. Thus, the influence of peers who smoke continues to need to be acknowledged and addressed in the planning of smoking prevention interventions (Ennett et al., 2008; B. Hoffman, 2006; B. R. Hoffman, Monge, Chou, & Valente, 2007; Kim, Fleming, & Catalano, 2009).

Our findings support research that has reported prevalence rates of smoking to be higher in Whites, then intermediate in Hispanics, and lowest in Black youth (Ellickson et al., 2004; Griesler & Kandel, 1998; Kandel et al., 2004). The racial/ethnic differences in smoking were more pronounced in recent smoking compared with ever smoking rates with Whites being three times as likely to be recent smokers compared with Blacks. Ever smoking rates ranged from 15.6% in Blacks to 17.3% in Whites, which suggests almost equal rates of smoking experimentation in all groups. This defines a need to target all three racial/ethnic groups to prevent smoking initiation as experimentation often leads to regular smoking in youth (Simons-Morton et al., 2004).

Blacks and Hispanics had a higher proportion of sociodemographic risk factors known to be associated with smoking,

such as lower parental education, single-parent household, and lower annual income (Griesler & Kandel, 1998). Similar to prior work, we found differences in recent parental smoking rates, which were higher in Whites compared with Blacks, and differences of up to 1.5 times higher recent and ever-smoking rates between White parents compared with Hispanic parents, which parallels the differences seen in recent smoking prevalence by racial/ethnic group in the youth. The prosmoking influences of parental and peer smoking were higher in Whites and may be associated with the greater risk for concurrent smoking in White youth compared with minority youth seen in our sample and thus support the evidence that White youth appear to be more vulnerable to peer and parental smoking than other racial/ethnic groups (Ellickson et al., 2003; Griesler & Kandel, 1998; Landrine et al., 1994).

We found support for the protective effect of all family influence measures in White youth, which differs from past research that found that factors such as connectedness and monitoring were more protective in minority youth (Ellickson et al., 2004; Griesler & Kandel, 1998; Headen et al., 1991; Mermelstein, 1999), and our findings add credence to the recommendation to develop interventions that incorporate strong parenting practices in the prevention of all youth smoking. Our data indicate that high levels of family factors such as connectedness, monitoring, and parental punishment were protective against smoking across all racial/ethnic groups. While all these factors have been shown to protect against smoking in prior studies (Griesler & Kandel, 1998; Kandel et al., 2004; Sargent & Dalton, 2001; Simons-Morton et al., 2004), our findings add to the literature by supporting that these influences are protective against smoking in non-White youth as well. Furthermore, we found that greater protection was usually afforded against recent smoking than against ever smoking with higher levels of family influences. This supports the research that suggests that such influences are protective against smoking transitions from experimentation to progression during adolescence (Simons-Morton et al., 2004); however, our findings need to be confirmed in a longitudinal sample. We also found protection against smoking in two racial/ethnic groups by factors that have not been examined in previous work. These were parental attitudes toward monitoring and intention to monitor. However, we also found significant correlations between these newer family influences and others, including parental intention to monitor and parental attitudes toward monitoring, punishment, and monitoring. It is possible that these differences in attitude were seen in the same set of parents who also exhibit higher levels of protective influences against smoking in general. Thus, it is possible that these newer measures may be better analyzed as a composite measure. Nevertheless, it is important to note that these protective family factors are significant over and above the strong prosmoking influences of parental and peer smoking. This finding and its possible protection against smoking behavior also need to be verified in a longitudinal sample to determine how these attitudes may be translated into protective parenting practices for future intervention development.

The current study is subject to limitations. First, smaller subsample sizes among Black and Hispanic youth may account for the greater number of significant risk and protective factors found for White youth compared with minority youth (Westat, 2006). Second, although the NSPY permits the examination of a

broad range of family factors that were potentially protective against smoking, important factors were not measured. For example, there are no measures of parental supportiveness, parental acceptance, or behavioral control, all of which are protective parenting practices (Chassin, Presson, Rose, & Sherman, 2001; Stanton et al., 2000). The dataset does not contain specific measures of parental antismoking socialization such as frequency and quality of explicit antismoking messages, which have been associated with decreased initiation (Jackson & Henriksen, 1997; Sargent & Dalton, 2001). These measures should be considered in future research. Finally, these data are based entirely on self-report without biochemical validation of smoking status. Nevertheless, similar measures have been employed in similar studies, and there is evidence that self-report data collected appropriately are broadly reliable and valid (Dolcini, 1996).

Despite these limitations, given the paucity of published research on ethnic-specific protective family factors against smoking initiation in large cohorts, we believe that our study carries substantial value and provides important information for researchers and clinicians involved in developing smoking prevention interventions among racial/ethnically diverse populations. Our results support earlier work that indicates that Hispanics and Blacks have a lower prevalence of smoking and Whites had higher rates of prosmoking influences (Ellickson et al., 2004; Griesler & Kandel, 1998; Kandel et al., 2004; Landrine et al., 1994). The findings of a graduated level of protection against smoking status by higher levels of family influences and antismoking parenting practices as well as the protection afforded by factors not previously evaluated need to be further investigated in longitudinal samples. Further analysis will rely on these findings and extend to longitudinal examination of smoking behavior to attempt to determine causal pathways in smoking onset or progression. Future work to replicate our results in large samples involving different youth cohorts and to determine how these findings can be translated into future parent-based smoking prevention interventions is warranted.

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## Declaration of Interests

None declared.

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