Authoritative Parenting and Cigarette Smoking Among Multiethnic Preadolescents: The Mediating Role of Anti-Tobacco Parenting Strategies

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Introduction Parenting has been shown to affect smoking among children in U.S. majority groups, but less is known about this association among multiethnic urban populations. Our study examines the role of parenting on smoking among a highly diverse sample. Methods Health surveys were collected from eighth graders (N = 459) in 2 low-income urban schools. Structural equation models examined the direct and indirect effects of authoritative parenting on lifetime smoking. A moderated mediation analysis examined whether indirect effects of authoritative parenting vary among racial/ethnic groups. Results Authoritative controlling parenting, characterized by limit setting, was positively associated with anti-tobacco parenting. Anti-tobacco parenting was inversely associated with smoking, mediating the relationship between controlling parenting and smoking. There was no evidence that mediation was moderated by race/ethnicity. Conclusions Parent training, which focuses on setting rules and expectations, can be an important and universal element of smoking prevention programs targeted to youth in diverse communities.

Key words adolescents; anti-tobacco parenting; parenting; parenting style; race/ethnicity.

Racial/ethnic differences in cigarette smoking prevalence rates among middle- and high-school students in the United States have consistently been reported in national studies over the past two decades (Johnston, O’Malley, Bachman, & Schulenberg, 2012; Griesler, Kandel, & Davies, 2002). By the 12th grade, 13% of White students report daily cigarette smoking, more than twice the rate of their African-American (5%) and Hispanic (5%) peers (Johnston et al., 2012). Paradoxically, in adulthood Hispanics and African-Americans experience higher rates of smoking-related health problems compared to Whites (e.g., Berry et al., 2012; Hayanga, Zeliadt, & Backus, 2013; Siegel, Ward, Brawley, & Jemal, 2011), with lung cancer risk for African-Americans 40–70% higher than other racial/ethnic groups (Haiman et al., 2006). Although there is a vast literature on how the social environment influences smoking trajectories from childhood into adulthood, models of parenting behavior and their influence on youth smoking risk have primarily been established among homogeneous samples of youth ages 10–18 years (Chassin et al., 2005; Hiemstra, Otten, & Engels, 2012; Jackson & Dickinson, 2011; Luyckx et al.,...
2011). There is less known regarding how parenting influences preadolescent smoking behavior among diverse racial/ethnic groups.

Parental smoking is a strong risk factor for smoking initiation among youth ages 12–17 years (e.g., Gilman et al., 2009), but this association may vary across race/ethnicity. Among high-school students, greater smoking risk is associated with one parent who smokes for Whites, two parents who smoke for Hispanics, and parent smoking is not significantly associated with daily smoking or lifetime dependence among African-American 7th–12th grade students (Hu, Davies, & Kandel, 2006). Youth whose parents are born outside the United States have been shown to have less risk for cigarette smoking, especially for racial/ethnic minorities and low-income youth (Acevedo-Garcia, Pan, Jun, Osypuk, & Emmons, 2005). Despite this understanding, there are still significant gaps in our understanding of how parenting factors impact youth smoking across race/ethnicity, nativity, and other cultural factors.

An authoritative parenting style has commonly been assessed by two intersecting dimensions: Response (support, positive parenting, and warmth) and control (behavioral regulation, demanding, strictness, and supervision) (Maccoby & Martin, 1983). There is evidence that authoritative parenting favorably impacts smoking risk among middle-school and high-school youth, serving as a protective factor (Chassin et al., 1998; den Exter Blokland, Hale, Meeus, & Engels, 2007; Luyckx et al., 2011; Otten, Engels, & van den Eijnden, 2008; Simons-Morton, Chen, Abroms, & Haynie, 2004). When examining elements of authoritative parenting as separate entities, low parental control (Chassin et al., 1998; den Exter Blokland et al., 2007; Otten et al., 2008) and low parental responsiveness (Chassin et al., 1998) were risk factors for youth smoking behaviors.

Studies of ethnic-specific effects of parenting style on youth smoking have shown mixed results. The protective effect of parenting style against smoking has been stronger for African-Americans compared to Whites in some studies (Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999; Mermelstein, 1999), but not others (Bohnert, Rios-Bedoya, & Breslau, 2009; Mahabee-Gittens, Xiao, Gordon, & Khoury, 2012; Nowlin & Colder, 2007). In a longitudinal study, Griesler and colleagues (2002) found that high levels of authoritative parenting (high control, high responsiveness) were associated with lower smoking initiation across racial/ethnic groups, but low levels of authoritative parenting was a smoking risk factor only among White youth. Further evidence is needed to understand how youth’s perception of maternal authoritative parenting impacts smoking behavior in diverse communities, and whether such parenting practices are more effective for specific racial/ethnic groups.

Similarly, anti-tobacco parenting strategies refer to specific behaviors (i.e., things parents do and/or says) to reduce the likelihood that their child will experiment with or use cigarettes or other forms of tobacco. These specific strategies have been studied and captured in a tobacco-specific parenting measure (Chassin et al., 1998) that assesses youth perceptions of how parents will react if the child were to be caught smoking: (a) punish him/her (e.g., privileges removed, grounded), and/or (b) discuss tobacco with him/her (e.g., reasons not to smoke, reasons why the child smoked). Anti-tobacco parenting strategies have been found to be associated with reduced risk of smoking among middle and high school students, further underscoring the potential protective effects of some parenting strategies on youth smoking risk (Andersen, Leroux, Bricker, Rajan, & Peterson, 2004; Chassin et al., 1998; Otten et al., 2008).

Prior studies indicate that anti-tobacco parenting strategies may vary by race/ethnicity. In a sample of urban African-American 8th–10th graders, students reported stronger parental rules and consequences for smoking use than their White counterparts (Skinner, Hagerty, & Catalano, 2009). Furthermore, in qualitative studies of urban and rural youth across socioeconomic strata, African-American youth report greater fear of letting their parents down, feeling that smoking would be disrespectful to their parents, and believing that parents would think less of them for smoking (Gittelsohn, Roche, Alexander, & Tassler, 2001; Kegler et al., 2002). However, Mahabee-Gittens and colleagues (2012) found that rules about smoking were not protective against recent or lifetime cigarette use for White, African-American, and Hispanic youth ages 9–18 years, but parental punishment for smoking was protective against recent smoking for all three races/ethnicities. These relationships varied according to reporting source (youth vs. parent) (Mahabee-Gittens et al., 2012). Though parenting style and anti-tobacco parenting strategies have each been shown to be effective in reducing youth tobacco independently, whether anti-tobacco parenting strategies mediate the relationship between authoritative parenting and lifetime smoking risk has not yet been examined.

Anti-tobacco parenting strategies may be especially effective in the context of particular authoritative parenting styles, and may partially explain why authoritative parents engage in more anti-tobacco parenting (Chassin et al., 2005; Otten et al., 2008). In samples of Dutch youth ages 13–17 years, the relationship between responsive
and control styles with smoking onset was affected by anti-tobacco parenting behaviors (Harakeh, Scholte, Vermulst, de Vries, & Engels, 2010; Otten et al., 2008). However, in a U.S. sample of mostly White youth ages 10–17 years, two types of anti-tobacco parenting behaviors (discussion and punishment if caught smoking) did not alter the relationship between parenting style and youth smoking (Chassin et al., 2005). The mixed findings could be due to differences in study methods (e.g., parenting style measurement) or participant characteristics (e.g., socioeconomic status, culture). Given these differences in findings, we aimed to assess whether anti-tobacco parenting mediated the relationship between authoritative parenting and lifetime smoking, as well as whether these mediation effects are moderated by race/ethnicity.

The purpose of the present study was to examine the direct and indirect effects of parenting style on lifetime smoking among a sample of U.S. 8th graders in two low-income, racially/ethnically-diverse urban middle schools. We hypothesized that maternal responsiveness and control (as measured by separate latent variables) and anti-tobacco parenting strategies will be associated with lower risk of lifetime smoking. We also hypothesized that perceived responsive and controlling parenting styles would be indirectly associated with lifetime smoking through perceived anti-tobacco parenting. Lastly, due to previous findings that African-American youth may be more protected from smoking than their White counterparts due to parenting behaviors, we proposed a moderated-mediation hypothesis to be tested in a structural equation model, such that African-Americans would be less likely to report ever smoking than their White and Hispanic counterparts due to the indirect effects of authoritative parenting. These study goals allow us to augment previous parenting models in majority (White) samples with an urban racially/ethnically diverse sample and extend these models by examining race/ethnicity as a moderator.

**Methods**

**Participants and Procedures**

As part of a larger project assessing youth health behavior, 459 eighth grade students attending regular education classes in two low-income inner-city middle schools (School 1, N = 210; School 2, N = 249) in the Northeast completed a classroom-based multidimensional self-report survey. Letters in English, Spanish, and Portuguese were sent to students’ parents/guardians explaining the study. Parents and students were given the opportunity to opt-out of survey participation. Across the study, only 17 students refused assent and 10 parents refused passive consent. The remaining students not captured had either transferred schools, moved, or were not captured in the multiple make-up days that were made available. There were fewer student moves/school transfers/absentees in School 1 (90% of eighth graders participated) compared to School 2 (67% of eighth graders participated). This may simply reflect the accuracy of the school rosters from which letters were sent. Although information about students who were unavailable or refused to participate is not available, there were very high participation rates that captured the majority of eighth graders (78% overall participation).

All surveys, passive parental consent, and active youth assent procedures were reviewed and approved by the Institutional Review Board of the host institution. Trained multilingual staff administered health surveys in students’ native language during an extended homeroom period. Several make-up days were provided by study staff to administer the surveys to students initially absent. At the end of survey completion participants received a movie ticket voucher, as well as written materials about tobacco prevention and healthy lifestyles.

**Measures**

**Maternal Smoking**

Maternal smoking status was assessed by asking participants to report on their mother’s current tobacco use with a single question: “Does she smoke cigarettes now?” Participants could respond with “no” or “yes” (0 = no, 1 = yes).

**Anti-Tobacco Parenting Strategies**

Anti-tobacco parenting strategies were assessed with four items from an established scale (Chassin et al., 1998, 2005) that asks the participant to report the likelihood that his/her mother would use a particular strategy in response to children’s smoking. In order to reduce participant burden, we selected four unaltered items from the original nine-item scale (Chassin et al., 1998) which had previously shown strong factor loadings. Behaviors are organized into two categories: (a) perceived punishment if caught smoking (take away something, like watching TV; ground you, restrict you from being with friends) and (b) perceived discussion if caught smoking (talk about the reasons not to smoke; and talk about why the participant had smoked). Participants were asked to rate responses on a 5-point Likert scale (1 = no way, probably not, maybe, probably, 5 = yes). Internal consistency in the current sample for the four-item adapted scale was good (Cronbach’s \( \alpha = .85 \)).
Maternal Authoritative Parenting
Maternal authoritative parenting was assessed with 6-items from an established scale (Authoritative Parenting Index; Jackson, Henriksen, & Foshee, 1998) that assesses participants’ perceptions of maternal responsiveness (e.g., being affectionate and accepting, providing comfort and support) and control (e.g., setting and enforcing clear standards of behavior, actively monitoring and supervising a child’s activities) behaviors using a 4-point Likert scale (not like her, sort of like her, a lot like her, just like her). For the purposes of this study, three responsive (e.g., “She tells me when I do a good job on things.”) and three control (e.g., “She has rules I must follow.”) items with high factor loadings were used to assess maternal parenting (.55–.72; Jackson et al., 1998). An Exploratory Factor Analysis supported the two-factor (responsiveness and control) structure, with high loadings for the responsiveness (.77–.89) and control (.69–.79) items \[ \chi^2 (4) = 7.55, \quad p = .11, \quad \text{CFI} = .997, \quad \text{RMSEA} = .04, \quad \text{SRMR} = .01 \]. Internal consistency of the adapted scale in this study was good (responsiveness Cronbach’s \( \alpha = .87 \), control Cronbach’s \( \alpha = .77 \), and total index Cronbach’s \( \alpha = .86 \)). Prior literature indicates that the API may have greater statistical reliability for Whites than African Americans (Weaver & Prelow, 2005). In the present study, the internal consistency total index varied between groups (White Cronbach’s \( \alpha = .89 \), Black Cronbach’s \( \alpha = .86 \), Latino Cronbach’s \( \alpha = .80 \), Other/Mixed Cronbach’s \( \alpha = .85 \)).

Lifetime Smoking Behavior
Lifetime smoking was assessed with two yes/no items: “have you ever smoked a cigarette?” and “have you ever tried or experimented with cigarette smoking, even a few puffs?” Participants endorsing either item were categorized as “lifetime smokers,” whereas those not endorsing either item were categorized as “never smokers.” Prior epidemiological studies have found that youth who had not smoked a cigarette, but had experimented with cigarettes were two to four times as likely to be regular smokers at 4-year follow-up; those who endorsed smoking a cigarette and experimenting were up to 18 times more likely to be regular smokers 4 years later (Choi, Gilpin, Farkas, & Pierce, 2001).

Covariates
Previous research has found that being older and having a mother who smokes (Weden & Miles, 2012) increases the risk of lifetime smoking. We examined whether student age and maternal smoking were associated with smoking outcomes in the present study and controlled for them as covariates accordingly.

Analytic Plan
Univariate analyses assessed the distributions of predictor, mediator, potential moderator, and outcome variables. Bivariate analyses assessed the relationships between potential covariates, predictor, and outcome variables. Covariates were selected if their bivariate associations with the outcome variables were statistically significant \( p < .05 \). After assessing bivariate relationships between potential covariates and smoking outcomes to determine the need for covariates, analyses were conducted in four steps. An initial confirmatory factor analysis (CFA) tested the measurement model including the factor structure, factor loadings, and model fit of the two latent representations of parental styles (responsive, controlling). The initial CFA was tested within each racial/ethnic group to assess model fit and identify the need for modifications. Then, the CFA was performed in a multiple-group format in which we systematically tested for measurement invariance across the racial/ethnic groups. Specifically we started by comparing a model in which all parameters were allowed to be freely estimated across racial/ethnic groups with a model in which the factors were held equal across racial/ethnic groups, using a \( \Delta \chi^2 \) test. The factor invariance (metric invariance) model was then further compared to a scalar invariant model in which both factors and intercepts were constrained to be equal across groups. A nonsignificant \( \Delta \chi^2 \) indicated that there was measurement invariance.

Then, a structural equation model (SEM) was used within which we constructed the mediational pathways. First, responsive and controlling parenting styles directly predicted the mediator (path a), anti-tobacco parenting strategies. Second, anti-tobacco parenting strategies directly predicted lifetime smoking (path b) controlling for the responsive and controlling parenting styles. Third, responsive and controlling parenting styles directly predicted lifetime smoking (path c). As such, the mediation effect is the product of the standardized regression coefficients from paths a and b. Fourth, 95% confidence intervals for the mediation effect of anti-tobacco parenting on the relationship between parenting styles and smoking outcomes were constructed using a bias-corrected bootstrap method. In the current setup we utilized 1000 resampling draws. This method has been shown to provide the most accurate confidence limits for mediation effects (MacKinnon, Lockwood, & Williams, 2004) and also provides more accurate Type I error rates and greater power to detect indirect effects (Preacher & Hayes, 2008). Fifth, we used a multiple-group SEM to examine whether the mediation effects were moderated by racial/ethnic group. We used a four-group race/ethnicity variable to represent White, African American, Latino, and Other/Mixed race/ethnicity.
African-American, Hispanic, and Other/Mixed racial/ethnic groups. Next, we examined whether an unconstrained model was significantly different from a model in which the a and b mediation pathways were constrained to be equal across racial/ethnic groups. A Satorra-Bentler scaled (mean-adjusted) chi-square difference test was utilized, where the chi-squares of each model were divided by a scaling correction to better approximate the chi-square distribution under nonnormality (Satorra, 2000). A nonsignificant chi-square difference indicated that there is no significant moderated mediation. We used a similar approach to also perform pairwise comparisons of the mediation effects between the race/ethnic groups.

SEM analysis was used for its ability to test indirect/mediating effects (Duncan, Duncan, & Strycker, 2006), linear and nonlinear effects on the criterion variables (Bollen, 1989), and latent variable constructs based on factor indicators. In addition to using the \( \chi^2 \) of Model Fit, the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual evaluated model fit when the \( \chi^2 \) of Model Fit was significant (\( p < .05 \)). Models with CFI > .95, RMSEA < .06, and SRMR < .08 indicated good model fit (Hu & Bentler, 1999). All analyses were performed using MPlus version 7.0 (Muthén & Muthén, 1998–2012).

### Results

#### Participant Characteristics

In our sample, students’ modal age was 13 years of age with a fairly similar gender distribution (58% girls School 1 and 50% girls School 2) between the two schools (\( \chi^2 = 2.86, p = .09 \)). Students identified themselves as Hispanic (29%), non-Hispanic African-American (34%), non-Hispanic White (17%), and Other/Mixed ethnicity (20%). Of those in the Other/Mixed ethnicity group, there were two participants who identified as Asian and one participant who identified as Native American. The remaining participants (\( N = 90 \)) in the Other/Mixed category identified as Mixed ethnicity. Over a fifth of participants (\( N = 96; 21\% \)) indicated that they had ever smoked or puffed a cigarette. Lifetime smokers reported lower controlling parenting (\( t = 2.50, p = .01 \)), lower responsive parenting (\( t = 2.53, p = .01 \)), and lower anti-tobacco parenting behaviors (\( t = 3.87, p < .001 \)) than never smokers. Older participants and participants with mothers who smoked were more likely to be lifetime smokers. African-Americans reported lower responsive parenting, controlling parenting, and anti-tobacco parenting behaviors than Hispanics. Overall, African-Americans were less likely to report ever smoking than all other ethnic groups. Group differences are reported in Tables I and II. Correlations are reported in Table III.

### Table I. Group Means, Standard Deviations, and Differences in Demographic and Maternal Characteristic Variables According to Lifetime Smoking Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total Sample</th>
<th>Never Smoker ( n = 355 )</th>
<th>Lifetime Smoker ( n = 96 )</th>
<th>( t )-test or Pearson ( \chi^2 ) (( p ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Age</td>
<td>( M = 13.75 ) ( SD = .67 )</td>
<td>( M = 13.72 ) ( SD = .68 )</td>
<td>( M = 13.90 ) ( SD = .66 )</td>
<td>( t = -2.30 ) (( .02 ))</td>
</tr>
<tr>
<td>Child Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>212 (46%)</td>
<td>172 (46%)</td>
<td>40 (49%)</td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>247 (54%)</td>
<td>205 (54%)</td>
<td>42 (51%)</td>
<td></td>
</tr>
<tr>
<td>Maternal Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>351 (79%)</td>
<td>302 (83%)</td>
<td>49 (61%)</td>
<td>( \chi^2 = 0.27 ) (( .60 ))</td>
</tr>
<tr>
<td>Yes</td>
<td>92 (21%)</td>
<td>61 (17%)</td>
<td>31 (39%)</td>
<td>( \chi^2 = 19.19 ) (&lt;( .01 ))</td>
</tr>
</tbody>
</table>

### Table II. Group Means, Standard Deviations, and Differences in the Predictors of Interest and Lifetime Smoking According to Ethnicity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Whites ( n = 77 )</th>
<th>African-American ( n = 157 )</th>
<th>Hispanic ( n = 134 )</th>
<th>Other/Mixed ( n = 93 )</th>
<th>F-test or Pearson ( \chi^2 ) (( p ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsive parenting</td>
<td>9.21 (2.65)</td>
<td>8.82 (2.83) *</td>
<td>9.87 (2.47) b</td>
<td>8.98 (2.87)</td>
<td>4.78 (( .01 ))</td>
</tr>
<tr>
<td>Controlling parenting</td>
<td>9.54 (2.71)</td>
<td>9.35 (2.59) *</td>
<td>10.26 (2.06) b</td>
<td>9.71 (2.40)</td>
<td>3.45 (( .02 ))</td>
</tr>
<tr>
<td>Anti-tobacco parenting</td>
<td>16.80 (4.54)</td>
<td>15.38 (5.24) *</td>
<td>17.57 (3.51) b</td>
<td>16.46 (4.81)</td>
<td>5.31 (( .001 ))</td>
</tr>
<tr>
<td>Child Lifetime Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>59 (77%)</td>
<td>141 (92%)</td>
<td>105 (79%)</td>
<td>71 (76%)</td>
<td>14.04 (( .003 ))</td>
</tr>
<tr>
<td>Yes</td>
<td>18 (23%)</td>
<td>13 (8%) *</td>
<td>28 (21%)</td>
<td>22 (24%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Different superscripts indicate significant Tukey’s HSD between ethnicities. *\( p < .05 \), indicating that African-Americans were less likely to report ever smoking than their White, Hispanic, and Other/Mixed ethnicity counterparts.
Confirmatory Factor Analysis

An initial model tested the adequacy of the latent variables using CFA with three indicators for responsive parenting and three indicators for controlling parenting. We specified that parental use of curfews and rules were correlated. The overall fit of the CFA was good, $\chi^2(7) = 11.69, p = .11$, CFI = .996, RMSEA = .04, SRMR = .02. No further modifications were made. All factor loadings were statistically significant for all indicators ($\beta = .68-.88, p < .001$). Responsiveness and control were allowed to freely correlate ($r = .71, p < .001$). Because we also aimed to examine the moderating effect of race/ethnicity, we tested measurement invariance across the ethnic/racial groups. First, we tested a multigroup CFA in which there was measurement noninvariance [$\chi^2(31) = 60.41, p = .001$, CFI = .98, RMSEA = .09, SRMR = .04] and compared this to a multi-group CFA which modeled measurement invariance of factor loadings (metric invariance). These two CFA models were not significantly different, $\chi^2(12) = 19.21, p = .08$, indicating that racial/ethnic groups had invariance across factor loadings. Next, we compared the multigroup CFA which modeled factor loadings invariance and a multigroup CFA which modeled factor loading and intercept invariance. These two models were not statistically different, $\chi^2(9) = 4.41, p = .88$, indicating that the latent variables had scalar invariance. Because the CFA demonstrated measurement invariance, we continued to the SEM step of our analytic plan.

Predictors of Anti-Tobacco Parenting Behaviors and Smoking Outcomes

We tested an SEM that modeled the direct effects of covariates (maternal smoking status, age), perceived parenting styles, and perceived anti-tobacco parenting behaviors on lifetime smoking. We also tested whether parenting styles had direct effects on anti-tobacco parenting behaviors.

Given the high correlation between parenting styles in the CFA, these two latent variables were modeled to correlate in the SEM. The SEM had good model fit, $\chi^2(29) = 29.54, p = .44$, CFI = .99, RMSEA = .01, SRMR = .02, and no further modifications were made. The control variables were significantly associated with the smoking outcomes in the SEM. Older participants and participants with mothers who smoked were more likely to report ever smoking.

Our hypothesis that parenting styles and anti-tobacco parenting behaviors would predict lifetime smoking was partially supported by the finding that greater anti-tobacco parenting behaviors was associated with the child’s never smoker status. Moreover hypotheses were confirmed in that greater controlling parenting was associated with greater anti-tobacco parenting behaviors. The SEM and pathway coefficient effect sizes are shown in Figure 1.

Mediation of Anti-Tobacco Parenting Strategies

We tested the hypothesis that perceived anti-tobacco parenting strategies mediated the relationship between perceived authoritative parenting style latent variables and smoking outcomes. This hypothesis was partially supported. Overall, the relationship between controlling parenting and lifetime smoking was significantly mediated by anti-tobacco parenting strategies ($\alpha*\beta = -.08, p = .02$), such that greater controlled parenting styles enhanced the effect of anti-tobacco parenting and resulted in lower odds of being a lifetime smoker. Overall, anti-tobacco parenting strategies did not seem to mediate the relationships between responsive parenting and lifetime smoking.

Ethnic Group Moderation of the Mediation Effect

We conducted a multiple group SEM to test for possible moderating effects of ethnicity on the statistically significant mediation effect, although small effect, detailed above.
Therefore, we evaluated an SEM in which racial/ethnic groups were considered simultaneously and separately. Model fit was good $\chi^2(140) = 174.43$, $p = .03$, CFI = .97, RMSEA = .05. SRMR = .07. We then compared this model to one in which the mediation pathways were constrained to be equal across racial/ethnic groups. There was no significant difference between these two models, $\chi^2(6) = 4.46$, $p = .61$. Though this test was not significant, we also completed a series of pair-wise comparisons in the same fashion for a total of six different tests. Consistent with the previous test, none of the racial/ethnic groups were significantly different from each other with respect to the mediation effect, $\chi^2(2) = .29$ to $4.34$, $p = .11$–.87. As such, there was no evidence from our formal tests that the ethnic-group specific mediation effects differed significantly from each other. Therefore, our moderated mediation hypothesis was not supported, though this may be due to the relatively low sample size of the individual groups. We present the standardized mediation effects, overall and separately for each race/ethnic group, together with 95% confidence intervals and $p$-values for tests for the presence of mediation effects (Table IV). For completeness and to further describe the mediation effects we are reporting as effect sizes the standardized regression estimates for the mediation pathways (MacKinnon, Fairchild, & Fritz, 2007) (Table IV).

**Table IV. Standardized Individual Pathway Coefficients of the Mediation and Bias-Corrected Bootstrap-Based 95% Confidence Intervals of the Standardized Mediation Effect of Anti-Tobacco Parenting Behavior for the Relationship Between Controlling Parenting and Lifetime Smoking**

<table>
<thead>
<tr>
<th></th>
<th>Pathway a coefficient ($p$)</th>
<th>Pathway b coefficient ($p$)</th>
<th>Lower 2.5%</th>
<th>Standardized mediation coefficient ($p$)</th>
<th>Upper 2.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Sample</td>
<td>.55 (&lt;.001)</td>
<td>-.15 (.01)</td>
<td>-.20</td>
<td>-.11 (.01)</td>
<td>-.02</td>
</tr>
<tr>
<td>Multigroup SEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>.05 (.90)</td>
<td>-.20 (.16)</td>
<td>-.16</td>
<td>-.01 (.86)</td>
<td>.13</td>
</tr>
<tr>
<td>African-American</td>
<td>.63 (&lt;.001)</td>
<td>-.16 (.19)</td>
<td>-.52</td>
<td>-.16 (.38)</td>
<td>.20</td>
</tr>
<tr>
<td>Hispanic</td>
<td>.66 (&lt;.001)</td>
<td>-.13 (.30)</td>
<td>-.46</td>
<td>-.12 (.46)</td>
<td>.21</td>
</tr>
<tr>
<td>Other/Mixed</td>
<td>.49 (.02)</td>
<td>-.17 (.13)</td>
<td>-.23</td>
<td>-.07 (.39)</td>
<td>.09</td>
</tr>
</tbody>
</table>

Note. The above table shows the results from two models: One model for the whole sample and a multi-group SEM model. Pathway a coefficient represents the relationship between controlling parenting and anti-tobacco parenting. Pathway b coefficient represents the relationship between anti-tobacco parenting and lifetime smoking. We note the overlap of the 95% confidence intervals for the race/ethnic group specific mediation effects, consistent with the results from the formal pair-wise tests that found no evidence of moderated mediation.

**Discussion**

Recent evidence supports the premise that parent-level factors influence risk of youth tobacco use (Chassin et al., 2005; Harakeh et al., 2010; Otten et al., 2008). Much of this research has focused on predominately White samples of youth. To extend prior research, our study sought to examine the direct and indirect effects of parenting style on reducing the risk of lifetime smoking, as well as how...
these relationships varied across White, African-American, Hispanic, and Other/Mixed ethnicity eighth graders.

Parents who are controlling (e.g., set rules, enforce curfews) may have youth with higher self-expectations and greater awareness of anti-tobacco parental reactions, and therefore reduced risk for smoking. We found support for this relationship in our diverse sample: Anti-tobacco parenting strategies strengthened the relationship between a controlling parenting style and tobacco use. These findings are similar to those reported in a recent study of Dutch youth (13–15 years), in where responsive and controlling parenting were positively associated with anti-tobacco parenting and anti-tobacco parenting was associated with lower risk of adolescent smoking (Otten et al., 2008). In contrast, Chassin and colleagues (2005) reported anti-tobacco parenting did not mediate the relationship between perceived authoritative parenting style and smoking outcomes in a predominately White, Midwestern sample of 6th–12th graders in the United States. One possible explanation for this difference is that we modeled parenting styles dimensionally rather than categorically. This was done to examine the protective effects of parenting style dimensions against tobacco use. Our results may also differ because parenting styles may function differently and be more protective against smoking in low-income neighborhoods among children ages 12–14 years (Chuang, Ennett, Bauman, & Foshee, 2005).

Responsive parenting was not significantly associated with anti-tobacco parenting or smoking outcomes in the present analyses. Given responsiveness has previously been associated with lower risk of smoking behavior (Chassin, et al., 1998), other intermediary factors may link the relationship between responsiveness and smoking uptake (e.g., child’s initial self-esteem and prevention of self-esteem decreases across time; Yang & Schaninger, 2010). Taken together, the results from the present study indicate that anti-tobacco parenting strategies are associated with reduced smoking behaviors in our sample of low-income, diverse students.

The mediation effects we evaluated did not vary among different racial/ethnic groups. Similar to findings from nationally representative samples, African-American youth in our study reported lower rates of ever smoking than their White, Hispanic, and Other/Mixed ethnicity counterparts (Eaton et al., 2008), despite reporting lower anti-tobacco parenting than Hispanics. However, based on the present findings, the indirect effect of authoritative parenting and the mediating effect of anti-tobacco parenting behaviors did not vary across racial/ethnic groups. Hence, authoritative parenting may be universally beneficial to reduce tobacco-use among youth across races. Of note, 64% of our sample reported having a mother born outside of the United States. We completed moderation analyses comparing foreign- and U.S.-born mothers that did not reveal any significant differences (results not shown). The lack of significant moderated-mediation effect findings may be attributed to the variability within racial/ethnic groups. For example, a large portion (63%) of African-Americans identified as Cape Verdan, whereas 31% and 18% of the Hispanic group identified as Puerto Rican and Columbian, respectively. Given tobacco prevalence varies across subgroups of Latinos (Carmona et al., 2004), subgroups may also vary across parent-level factors that impact youth smoking risk. Lastly, we note that the nonsignificant results for the moderated-mediation may also be due to the combination of small indirect effects with smaller samples sizes when the sample was divided by race/ethnicity. The overall test for mediation included the whole sample size. Hence, the null-findings of the moderated-mediation analysis should be interpreted cautiously and warrant further studies in larger, nationally representative and racially/ethnically diverse samples that also allow for the analysis of subgroups.

In sum, the present findings highlighted that ethnically-diverse parents who engage in a controlling parenting style, such that they structure and enforce general household rules (e.g., curfews, bedtimes), are also more likely to engage in anti-tobacco parenting behaviors to deter youth tobacco use. Furthermore, parents who engage in a controlling parenting style may have the greatest likelihood of reducing their middle schooler’s risk of cigarette smoking through engagement in anti-tobacco parenting behaviors. The current study reinforces previous models of parenting associations with smoking in majority White samples, and extends the literature by examining parenting factors in a racially/ethnically diverse sample of youth from low-income schools. The null findings from the moderated mediation analysis indicated that these effects are invariant among racial/ethnic groups. This important finding supports the role of authoritative parenting skills in conjunction with anti-tobacco parenting behaviors to reduce the risk of lifetime smoking universally among ethnically-diverse students. In the present study, we utilized latent variables to best capture the variegated nature of parenting style constructs.

In light of these study strengths, we must also consider its limits. First, we utilized a cross-sectional study design, which may not fully capture the discrete time varying nature of smoking behavior and progression. Though our mediation analysis utilized bias-corrected bootstrap confidence intervals, the present findings may be biased due to the cross-sectional nature of the data (Maxwell & Cole, 2007). As such, we are also not able to rule out
common method variance interpretations given that data were derived from a single questionnaire. The present study provides an important baseline of parent-level factors and tobacco prevention for future longitudinal studies of ethnically-diverse youth. The measures included in the study are based on youth perceptions of parenting style and anti-tobacco parenting behaviors. Therefore, we cannot definitely state what parental behaviors actually occurred. As noted, youth’s perception of parental style and strategy may be more effective and meaningful in the translation to smoking prevention.

Parent training is a core component of work in pediatric psychology. Evidenced-based research is needed to continue to advance cultural competence in the delivery of parent training so that pediatric psychologists remain at the forefront of developing and delivering culturally relevant prevention interventions to ethnically-diverse families (Lescano, Brown, Raffaelli, & Lima, 2009). Results of this study provide support for the importance of family-focused youth prevention programs that target both parenting style and anti-tobacco parenting behaviors in prevention efforts to deter smoking behavior among vulnerable and underserved urban youth. Traditionally, empirically validated parent-involved smoking prevention programs in the United States have largely been conducted among White samples (Thomas, Baker, & Lorenzetti, 2009) and treatment effects have been generally more favorable for White youth (Bauman et al., 2001; Connell, Dishion, Yee, & Kavanagh, 2007). Culturally-tailored programs that include parent training hold promise, as evidenced by a recent study that incorporated a parent training component focused on effective communication and parental monitoring strategies for preventing youth tobacco use among African-American and Hispanic mother–child dyads in a school-based smoking prevention program (Guilamo-Ramos et al., 2010). Children whose mothers participated in the culturally-tailored parental component were 42% less likely to use cigarettes and perceived their mother as more trustworthy (Guilamo-Ramos et al., 2010). Future programs that account for culturally-specific values may strengthen engagement in authoritative parenting and anti-tobacco parenting behaviors and thereby reduce tobacco use among ethnically-diverse youth.

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References
transmission of parenting and smoking.
Developmental Psychology, 34, 1189–1201.


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