Original Investigation Parental and peer influences on teen smoking: Are White and Black families different?

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Abstract

Introduction: The health risks associated with smoking disproportionately burden Blacks, and Black adults are more likely to smoke than are White adults. Most adult smokers have their first smoking experience as teenagers; however, rates of smoking initiation during adolescence remain lower among Black compared with White youth.

Methods: The level and impact of family and peer risk and protective factors on adolescent smoking across both groups were modeled prospectively from 8th to 10th grade in a sample of 331 (Black n=162, White n=168) families using data from self-administered computer-assisted questionnaires. Predictors included parent smoking, guidelines against substance use, monitoring, consistent discipline, attachment to parents, and association with deviant peers.

Results: Mean-level differences indicated greater risk for Black teens in some cases and higher protection in others. Multiple-group structural equation modeling indicated no race differences. Several factors affected both groups: (a) parenting factors reduced association with deviant peers, (b) association with deviant peers increased the risk of smoking in the 10th grade, and (c) teens were more likely to smoke if their parents smoked.

Discussion: Reduced smoking among Black teens compared with White teens may be due to the protection of clear parental guidelines about substance use and clearly stated consequences for failure to observe those guidelines.

Introduction

Although adult smoking has declined (Centers for Disease Control and Prevention [CDC], 2005), it remains the single most

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Disclaimers:

An earlier version of this paper was presented in March 2006 at the Society for Research on Adolescence annual meeting in San Francisco, CA. The content of this paper is solely the responsibility of preventable cause of disease and death in the United States. The health risks associated with smoking (e.g., cancer, lung disease, and hypertension) disproportionately burden Blacks (CDC, 1998), and Black adults are more likely to smoke than White adults (Giovino, Schooley, & Zhu, 1994; Kiefe et al., 2001). Most adult smokers have their first smoking experience as teenagers; however, rates of smoking initiation during adolescence remain lower among Black compared with White youth (Kandel, Kiros, Schaffran, & Hu, 2004). Parent and peer factors are important predictors of teenage smoking (Fleming, Kim, Harachi, & Catalano, 2002; Patterson, Reid, & Dishion, 1992; Simons-Morton, Chen, Abroms, & Haynie, 2004; Tilson, McBride, Lipkus, & Catalano, 2004) during high school (Johnston, O'Malley, & Bachman, 2002). However, few studies have examined whether the level and impact of these predictors differ between White and Black youth.

Parent influences include the parent's own smoking status (Engels, Vitaro, Blokland, de Kemp, & Scholte, 2004; Taylor, Conard, Koetting O'Byrne, Haddock, & Poston, 2004), as well as the quality of the parent-teen relationship, referred to as bonding or attachment (Hill, Hawkins, Catalano, Abbott, & Guo, 2005). Additionally, parenting behaviors such as monitoring and consistent discipline influence teen problem behaviors (Patterson et al., 1992). Finally, parenting specific to substance use, such as communicating guidelines against and establishing clear consequences for smoking, reduces smoking among children and teens (Jackson & Henriksen, 1997). Peer influences include having friends who smoke and associating with a deviant peer group (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001; Snyder, Dishion, & Patterson, 1986; Taylor et al., 2004). The impact of parental factors may be mediated through parental influences on peer selection (Engels et al., 2004), which in turn influences teen attitudes and tobacco use.

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Lower rates of smoking among Black teens may be due to exposure to lower risk and higher protection than their White counterparts. Research to date has been mixed. Low income and education are associated with smoking, and both factors are more prevalent among Blacks than Whites in the United States. This finding is consistent with higher rates of smoking and lower rates of cessation among adults (Kiefe et al., 2001) but is at odds with race differences among youth. Higher rates of smoking among Black adults suggest that Black youth are more likely to live with a parent who smokes, compared with White youth, conferring a greater risk on Black teens. Black high school seniors report less family conflict but higher dissatisfaction with their parents than White seniors. No race differences were found in levels of parental disapproval of marijuana and cocaine use or monitoring of social activities or homework (Wallace & Muroff, 2002). Among peer predictors, Black seniors reported fewer friends who smoke, drink, or get drunk and less time spent around people who were drinking or taking drugs (Wallace & Muroff, 2002). Additionally, Faulkner, Escobedo, Zhu, Chrismon, and Merritt (1996) found no evidence that race differences in level of risks explained race differences in adolescent smoking. Catalano et al. (1993) found that Black fifth graders were exposed to more deviant siblings. However, they also were exposed to higher levels of proactive family management, considered a protective factor.

Differences in smoking rates between Black and White teens may be due to differences in vulnerability to risk and protective factors. The research supporting differences in vulnerability has been mixed. The influence of peers who smoke may be stronger for White than Black youth (Kandel et al., 2004; Unger et al., 2001; Wallace & Muroff, 2002). The evidence for race differences in the impact of parenting practices is particularly inconsistent (Catalano et al., 1993; Griesler, Kandel, & Davies, 2002; Wallace & Muroff, 2002). In qualitative research on ethnic and gender differences in teen smoking (Kegler et al., 2002), both Black and White teens reported receiving strong messages about negative health effects and perceived they would get into trouble if they smoked. However, Black youth reported stronger concern for losing the respect of a parent, whereas White youth were more likely to report smoking was allowed in their homes, even for teens (Gittelsohn, Roche, Alexander, & Tassler, 2001). Black parents felt more empowered to affect their children's behavior than White parents and were more likely to have communicated rules about smoking (Clark, Scarisbrick-Hauser, Gautam, & Wirk, 1999).

We looked for evidence that race differences in smoking are associated with race differences in mean levels of risk and protective factors. Risks include low income, parental smoking behavior, and association with deviant peers. Protective factors include parental monitoring, consistent discipline, guidelines against substance use, and quality of the parent-teen relationship. We looked for evidence of differential vulnerability to risk and protective factors by race by testing for race differences in a structural model of risk and protective processes influencing teen smoking. The impact of parenting is mediated through association with deviant peers. Evidence supporting this mediation has been provided primarily in White samples (Forgatch & Stoolmiller, 1994; Oxford, Harachi, Catalano, & Abbott, 2001; Patterson & Dishion, 1985).

Methods

Study design and setting

The present study drew data from 331 families in a longitudinal study of the impact of *Parents Who Care*, a preventive intervention to reduce substance abuse in adolescence. Intervention effects on smoking were examined in preliminary analyses and were not significant. Further, no intervention effects were found on the mediating effects of associating with deviant peers or on the magnitude of relationships in the models tested.

Parents of 8th-grade students in Seattle Public Schools received a letter describing the study, and the parents were contacted by phone. Families were included if the teen and one or both parents consented to participate. Eligibility included selfidentifying as Black or White, speaking English as the primary language, and planning to live in the area for at least 6 months. Some 46% consented (55% of Blacks and 40% of Whites). The parents who refused were more likely to be White or married, and they had a higher education on average than those who consented. Other ethnic groups were not recruited. All protocols were approved by the University of Washington (Seattle, WA) internal review board.

The sample was stratified by teen race and gender. We found significant differences by race in several demographic variables. Whites reported higher per capita income and parental education, and Blacks reported higher prevalence of single parenthood (Table 1). Some teens in each race group self-identified as mixed race (19.6% of the Blacks and 12.5% of the Whites) but were included in these analyses. More than 80% of the primary caregivers were female; 71.6% were the adolescents' biological mothers. Gender and relationship were similar across race, with one exception: compared with White youth, more Black youth had another female caregiver (e.g., grandmother, aunt) as a primary caregiver, $\chi^2(1) = 13.95$, p < .001.

Questionnaires were self-administered to the teen and his or her primary caregiver in the family's home using laptop computers while the data collector was present. This approach ensured that parents did not monitor their teens' responses. Identical questionnaires were collected when the teens were in the 8th, 9th, and 10th grades. Family members received US\$15 each time they completed questionnaires. Parents received \$65 and teens received \$15 for completing observational measures (not included here).

Attrition analyses. At posttest, 94.7% of the sample participated in the survey (93.2% of the Blacks and 95.2% of the Whites). During the 1-year follow-up, 92.5% of families were interviewed (92% of Blacks and 92.9% of Whites). The 2-year follow-up yielded 92% of the sample with no completion differences by race. Both parent and teen interviews were completed for 301 families. We found no significant differences between those who were lost to attrition and those who were not on any of the variables included in these analyses.

Measures

Data on demographics and parenting were collected when participants were in the eighth grade. Parents reported their child's race on school enrollment forms. Household per capita income was calculated from the parent's endorsement of 1 of 11 categories of annual household income (before taxes). We assigned

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Variable	African American (SD)	European American (SD)	Total (SD)
Eighth grade			
% Male	50.9	51.8	51.4
Mean age of child	13.7 years (0.48)	13.7 years (0.40)	13.7 years (0.44
Mean per capita income	\$7,807 (9,390)	\$21,970** (15,958)	\$15,042 (14,932)
1+ parent currently smokes (%)	43.6	18.5**	30.8
Guidelines	3.28 (0.75)	3.00** (0.67)	3.14 (0.72)
Attachment	101.82 (19.48)	104.07 (21.62)	102.95 (20.57)
Monitoring	3.48 (0.48)	3.49 (0.44)	3.48 (0.46)
Discipline	3.43 (0.79)	3.35 (0.75)	3.39 (0.77)
Ninth-grade deviant peers			
Serious school trouble (%)	31.6	21.5	26.4*
Delinquent behavior (%)	26.9	23.5	23.5
Smoking marijuana (%)	33.1	32.7	32.7
Drinking alcohol (%)	42.8	51.6	47.1
10th grade			
Smoked in past year (%)	15	22	18

Table 1. Sample characteristics by race

Note. *Significant race difference p < .05; **p < .001.

the midpoint of the range and then divided by the number of people in the household. To reduce the effects of outliers, we used a log transformation.

Parent smoking status was scored on a 4-point scale to indicate level of exposure to parental smoking (Jackson & Henriksen, 1997); a "3" indicated that at least one of the parents currently in the home smoked a half pack or more per day over the prior month (heavy smoker). A score of "2" indicated that one or both parents had smoked in the past year but neither were heavy smokers (current smokers). A score of "1" indicated neither parent was a current smoker but either had smoked in the past (past smokers), and a score of "0" indicated neither parent currently in the home ever smoked. Single parents reported on their own smoking only.

Parental guidelines (rules and consequences for substance use) were assessed with six items ($\alpha = .79$) on a 4-point scale measuring their agreement with statements such as "I have clear and specific rules about my teen's use of tobacco, alcohol, and illegal drugs." Monitoring was assessed with the mean of teen responses to seven items (α = .77) on a 4-point scale (YES!, yes, no, NO!), for example, whether the teen believes his/her parent knows who his/her friends are, where the teen is, and what he/ she is doing. Discipline was measured using the mean of two items (r=.47) on the same 4-point scale: "If you skipped school, would you get caught and punished?" and "If you drank beer or wine without your parent's permission, would you get caught and punished?" Parent-teen attachment was measured using the sum of 28 items ($\alpha = .94$) from the teen report on the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987).

Delinquent behavior and substance use of peers were measured with teen report in the ninth grade. The teens were asked to name their three best (or closest) friends (first names or initials only) and were then asked a series of questions about each of those friends: alcohol and marijuana use, getting in serious trouble at school, or having done anything in the last year that could have gotten them in trouble with the police. A dichotomous score was created for each question, with a "1" indicating at least one of the friends had engaged in the behavior. In the 10th grade, teens were asked if they had smoked any cigarettes in the past year. Responses were coded as "1" for yes and "0" for no.

Results

Race differences in mean levels of measured indicators of risk, protection, and smoking were tested using multivariate analysis of variance for continuously measured variables and chi-square for dichotomous variables. Correlated measures of parental influences (monitoring, discipline, attachment, and guidelines) and deviant peer behaviors (marijuana and alcohol use, delinquent behavior, and trouble at school) were modeled as latent constructs (Jöreskog, 1971). Multiple-group confirmatory factor analysis (Bontempo & Hofer, 2006; Muthén, 1989) was used to establish measurement invariance and to test for race differences in levels of latent constructs.

Blacks were less likely than Whites to report smoking in the 10th grade (see Table 1); however, the difference was not significant. Blacks were significantly more likely than Whites to have a parent who currently smoked ($\chi^2 = 31.4$, df = 3, p < .0001). Black families reported significantly lower per capita income than White families (t = 9.67, p < .0001). Black parents reported significantly higher guidelines against substance use (t = 3.49, p = .0006). Black teens reported slightly higher association with peers who get in serious trouble at school ($\chi^2 = 3.86$, df = 1, p = .05).

Multiple-group confirmatory factor analysis was conducted on the two latent constructs, parenting and deviant peers. The intercept and loading for guidelines were significantly higher in the Black than White sample and were freely estimated, whereas all other intercepts and loadings were constrained to be equal across groups. These results suggest an acceptable level of equality of the measures across race. No differences in mean levels of parenting and deviant peers between Black and White families were detected (t = -.43 and -1.36, respectively). Similar analyses confirmed no differences in measurement parameters by gender.

Multiple-group structural equation modeling (SEM; Muthén & Muthén, 2004) was used to compare the magnitude of the impact of risk and protective factors by race (see Figure 1). We compared the fit of multiple-group SEM with all path coefficients allowed to differ between race groups to multiple-group SEM with all path coefficients constrained to be equal across race using a derivatives differences test. This comparison revealed no significant different in fit between the constrained and unconstrained models, indicating the magnitude of the impact of risk and protective factors was not significantly different for Black and White families. The constrained model fit the data adequately (Figure 1; $\chi^2 = 63.41$, df = 9, p = .08, comparative fit index = 0.98, Tucker-Lewis index = 0.98). Although standardized measures of effect size cannot be compared directly across groups, among White youth 30% of the variance in smoking was explained and among Black youth only 8% of the variance was explained.

Discussion

We examined two possible mechanisms for the influence of race on smoking in the 10th grade: (a) differences in the mean levels of risk and protective factors and (b) differences in vulnerability to risk and protective processes. Black teens were more likely than White teens to have parents who smoke, which should place Black teens at greater risk. However, Black parents reported higher levels of guidelines against substance use, which could protect Black youth from the negative influences of risk factors (Hill et al., 2005). This race difference is consistent with the finding of focus groups in which Black parents reported stronger feelings of efficacy (Clark et al., 1999). However, teen reports of family management and positive bonding did not differ by race nor did levels of deviant peer associations.

We found measurement differences in the latent variable for parenting but not in the model relating risk and protective factors to teen smoking. Among the Black families, parent reports of guidelines were correlated with teen reports of attachment, monitoring, and discipline, forming a coherent construct reflecting positive family influences hypothesized to reduce the risk of smoking. Among White families, the parenting construct relied completely on the teen reports. The parent reports of guidelines did not load on the parenting factor.

We found no race differences in the magnitude of relationships between risk and protective factors and smoking. Across both race groups, we found positive family influences reduced deviant peers, as expected. The hypothesized mediated process by which parenting reduced association with deviant peers, which in turn reduced the likelihood of teen smoking, was confirmed. We found no evidence of direct effects of income or parenting in eighth grade on smoking in 10th grade. The effect of family income on teen smoking was mediated through parent smoking such that lower income predicted parent current smoking status, which in turn increased the likelihood of teen smoking. Family income was positively related to parenting, which in turn decreased association with deviant peers in both groups.

The strengths of the present study include parent and teen reports, a longitudinal design, and a sample with equal numbers of Black and White families. However, we failed to gather data on the smoking status of the teens' peers (Unger et al., 2001). Despite this omission, we still observed the expected relationship between deviant peers and smoking a year later. We also failed to ask questions of the teens and parents that dealt more specifically with efforts the parents make to discourage their

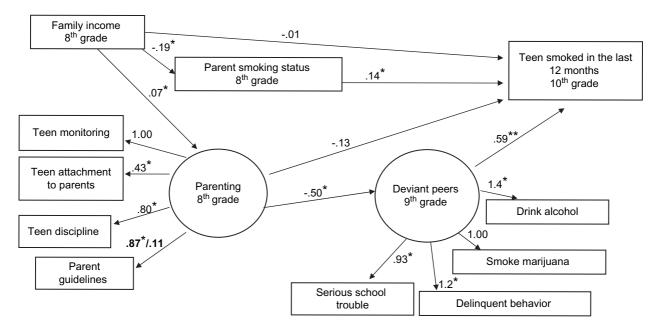


Figure 1. Unstandardized factor loadings and parameter estimates for Blacks and Whites with partial invariance. Separate parameters for Black and White groups indicate significant differences in multigroup CFA and structural equation modeling analyses (Black/White).

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teens from smoking. This, in fact, may account for the nonsignificance of the direct relationship between parenting and teen smoking. The items used to measure discipline somewhat confounded monitoring and consequences because they asked, "If you were caught, would you be punished?" This weakness in the specificity of the measure may reduce its ability to capture the meaningful variance in parenting practice. Another possible limitation of the tested model is that it predicts smoking behavior at one timepoint. Including measures of earlier smoking behavior would shift the focus to predicting change in smoking over time, increase the explained variance in later smoking, and possibly eliminate the significance of other predictors. We tested such a model and found the significance of predictive relationships to be the same as we reported here.

In conclusion, reduced smoking among Black teens, compared with White teens, may be due to the protection of clear parental guidelines about substance use and clearly stated consequences for failure to observe those guidelines. Black families may establish guidelines earlier in the child's development, perhaps in response to risky environments rather than the child's risky behavior. White parents may wait until they see evidence of difficulty. These findings support the use of family-based interventions targeted at establishing guidelines and consequences for smoking and for associating with peers who use substances and are involved in other problem behaviors before these risks are present.

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Declaration of Interests

RFC is a board member of Channing Bete Company, distributor of the Parents Who Care program, which was tested as part of the study described in this paper.

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