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## Racial centrality mediates the association between adolescent racial discrimination and adult cigarette smoking outcomes among Black Americans

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### Abstract

**Objective:** The objective of this study was to investigate racial centrality as a mediator of the association between Black adolescents' racial discrimination experiences and their cigarette use in early adulthood.

**Methods:** The data were drawn from the Family and Community Health Study, which is a longitudinal study of Black American families that began in 1996. Families with a child in 5th grade who identified as Black or African American were recruited from Iowa and Georgia. At baseline, there were 838 Black American children. Hierarchical regressions and bootstrap tests of the indirect effects were used to investigate whether racial centrality at Wave 5 (mean age = 21.6 years) mediated the association between adolescent discrimination at Waves 1–4 (mean ages = 10.5–18.8 years) and adult cigarette use at wave 6 (mean age = 23.5 years).

**Results:** Bivariate associations indicated racial discrimination was significantly associated positively with racial centrality and adult use of cigarettes. Racial centrality indirectly affected the association between racial discrimination and cigarette use such that greater racial centrality was associated with less cigarette use. Further, racial centrality *predicted cessation* among those who had smoked. Finally, racial centrality was higher among those who never smoked and those who had smoked and quit, relative to those who currently smoke.

**Conclusions:** These findings suggest that having strong Black racial centrality is a mediator that reduces the risk of cigarette use among young adults who experience racial discrimination

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Declaration of competing interest

None.

in adolescence. In addition, racial centrality also predicts smoking cessation among young Black Americans who smoke. Translational implications of these findings are discussed.

## Keywords

Racial discrimination; Racial centrality; Cigarette use; Black/African American

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## 1. Introduction

Black youth and adults in the US are significantly more likely to experience both institutional and individual-level racism than are members of other racial or ethnic groups (Bleich et al., 2019). Extensive research indicates that racial discrimination is associated with a range of health behaviors including increased substance use in general (Carter et al., 2019; Currie et al., 2015; Desalu et al., 2019; Gibbons et al., 2004), and increased tobacco use in particular (Bennett et al., 2011; Corral and Landrine, 2012; Hooper et al., 2020; Parker et al., 2016). In this context it has been hypothesized that tobacco use may be a means to manage stress including stress caused by racial discrimination (Corral and Landrine, 2012; Paradies, 2006; Parker et al., 2016). Taken together, these studies suggest that racial discrimination is a critical risk factor to consider when seeking to understand the development of tobacco use problems among Black American youth across the age of risk for onset of smoking.

There is also evidence to suggest that racial identity is protective against the effect of racial discrimination on poor health outcomes (Jones and Neblett, 2016, 2017; Sellers et al., 2006; Stock et al., 2018). Racial identity development often occurs in adolescence and is the process by which people become aware of the ways in which their race or ethnicity impacts their experiences in the world (Helms, 1990; Sellers et al., 1997; Swanson et al., 2009). Although there are multiple components of racial identity, a key component is racial centrality (Sellers et al., 1997) — the extent to which race (e.g., identifying as Black or African American) is central to a persons' identity. Adolescence is an impressionable time and experiences of racial discrimination during this time may be more impactful particularly on smoking outcomes (Gibbons et al., 2018). Laboratory and observational studies suggest that those with a strong Black identity may be protected from the negative effects of racial discrimination on substance use (Caldwell et al., 2004; Clifton et al., 2021; Stock et al., 2011; Zapolski et al., 2017, 2019). Researchers have reported that having a strong Black identity was negatively associated with nicotine dependence (Brook et al., 2007). A strong Black identity is also associated with psychological wellness (Helms, 1993) and high self-esteem (Goodstein and Ponterotto, 1997), which may reduce or eliminate the need to cope with experiences of racial discrimination by smoking tobacco. However, no study has examined whether racial centrality mediates the association between youth exposure to racial discrimination and later tobacco use.

A number of studies have identified links between racial centrality and health-promoting behavior including more disapproval of substance use (Cherry et al., 1998; Rivas-Drake et al., 2013) and less substance use (Pugh and Bry, 2007). Prior research found that racial discrimination is negatively associated with smoking cessation among Black participants in

treatment for their tobacco use (Hooper et al., 2020); however, this study did not inform mediators that might underlie the association between racial discrimination and smoking cessation, such as racial centrality. Given that prior research suggests racial identity may buffer the harmful effect of racial discrimination on poor outcomes, it is possible that Black adults who have developed a stronger sense of racial centrality may have more success with smoking cessation despite experiencing racial discrimination; however, this has yet to be tested.

The effect of racial centrality on the association between racial discrimination and cigarette smoking among Black people has been studied less often. This is surprising for several reasons, including the fact that Black adults are *more* likely to die from smoking-related diseases than are White adults (Desantis et al., 2016; Ho and Elo, 2013; Lortet-Tieulent et al., 2016; Siegel et al., 2021)—a reflection of what has been labeled a “racial cross-over” effect (Watt, 2008). The term refers to the tendency for Black adolescents to start using substances later than White adolescents (Johnson and Hoffman, 2000; Trinidad et al., 2004), but then among people who use substances, the percentage of Black people who report substance-related *problems* later in adulthood is often higher than it is for White people who use substances (Pamplin et al., 2020; Vasilenko et al., 2017). Tobacco use has shown more evidence of a cross-over effect than other substances (Kandel et al., 2016). In addition, there is some evidence that cigarette smoking initiation predicts later use of other substances (Kandel and Kandel, 2014, 2015; Kristjansson et al., 2017; Torabi et al., 1993) making it an important outcome to study. From a translational perspective, cigarette smoking is of interest because if developing strong Black racial centrality during adolescence counters the harmful effects of racial discrimination experienced in adolescence and results in subsequently less cigarette use, then interventions based on racial centrality may help delay onset, counter the cross-over effect, and (perhaps) facilitate quitting among Black people.

### 1.1. The current study

The objective of this study was to investigate the effect of racial discrimination experienced during adolescence on tobacco use outcomes in young adulthood and to test whether racial centrality mediates these effects among Black American adults. First, as previously found (Gerrard et al., 2022), we expected that racial discrimination would predict racial centrality; and, again consistent with previous research (Anderson et al., 2020; Fuller-Rowell et al., 2012; Saleem et al., 2020; Stock et al., 2018), we expected that racial discrimination in adolescence would be associated with increased risk for tobacco use in young adulthood. We hypothesized that racial centrality would mediate the association between racial discrimination and smoking outcomes such that developing stronger racial centrality would be a mediator that, at least partially, explains decreased risk for cigarette use as well as lower odds of relapse and greater odds of smoking cessation in young adulthood among Black American adults who smoke despite experiencing racial discrimination in childhood.

## 2. Methods

### 2.1. Participants

**Sample.**—The sample was drawn from the Family and Community Health Study (FACHS), which is an ongoing multisite, longitudinal study of 889 Black American families that began in 1996. Families were recruited from Iowa and Georgia (approximately half from each state) if they had a child in 5th grade who identified as Black or African American (478 girls and 411 boys). Survey data for the current study came from the first six waves of data collection, when the children were, on average, 10.5, 12.5, 15.5, 19, 21.5, and 23.5 years old.

**Recruitment.**—The FACHS families were from 259 census block group areas, which varied in racial composition and were in predominantly middle- or low-income sections of small cities and suburbs. School liaisons and community coordinators developed lists of families in their areas who had a Black American fifth grader. Families were selected randomly from the lists and were recruited with a letter and subsequent phone call. Of the families recruited, 72% agreed to participate. Most families who chose not to participate gave the length of the interview process (up to 2½ hours) as their reason. At each wave, all participants from the original Wave 1 sample were recruited, so that even if a participant dropped out at one wave, they could return in later waves. See earlier studies (Gerrard et al., 2005; Gibbons et al., 2004) for additional details of the FACHS sample.

**Procedure.**—All interviewers identified as Black or African American; most lived in the areas of the study where the families lived. They received approximately 40 h of training. At each wave, a pair of interviewers made one or two visits to the families' homes or nearby locations for the interviews. The Computer Assisted Personal Interview (CAPI) technique was used. Participants were compensated for their time, ranging from \$70 at Wave 1 to \$150 at Wave 6. Assent was obtained from the children/adolescents at each wave until age 18; after that, informed consent was obtained. All procedures were approved by relevant university IRBs.

### 2.2. Measures

**Demographic characteristics.**—Participants self-reported all demographic characteristics, including their race, age, and sex. However, participants' race was based on their primary caregiver's report that their child is Black or African American (94% monoracial Black, 6% multiracial Black). Only monoracial participants were included in this study ( $n = 838$ ), given prior evidence of differential patterns of association of racial discrimination, racial identity, and substance use between monoracial vs multiracial people (Nalven et al., 2021). Sex was operationalized as male and female. SES was based on the reports of the primary caregivers and was operationalized as the average of the standardized value of the primary caregivers' completed years of education and the standardized value of the log of the household income.

**Neighborhood Characteristics.**—The neighborhood's racial composition was determined from census data on the percent of the population who were Black American in

the block group. This was included as a covariate in the analyses. The census block area was also considered in a clustered standard errors analysis.

**Racial Discrimination.**—Racial discrimination was measured using a 13-item version of the Schedule of Racist Events (Landrine and Klonoff, 1996). This measure is commonly used in the discrimination literature (Pascoe and Richman, 2009). Participants were asked to describe various discriminatory events and how often in their life they have experienced different types of each event because of interpersonal racism due to their race, e.g., “How often has someone suspected you of doing something wrong or insulting you just because you are African American?” (1 = never, 2 = once or twice, 3 = a few times, 4 = several times). To get a more complete picture of the participant’s experiences with racial discrimination during childhood and through adolescence, racial discrimination assessments at Waves 1–4 were averaged to produce a cumulative racial discrimination score (RD 1–4). This was done because it was assumed that multiple waves would provide a better overall assessment of the adolescents’ *lifetime* discriminatory experiences. Also, previous research has shown that studies that assess racial discrimination at only one time point underestimate its effect on the health of People of Color (Wallace et al., 2016). For all four waves, each  $\alpha$  was  $>0.85$ ; for the aggregate (RD 1–4),  $\alpha = 0.94$ .

**Racial Centrality.**—Racial Centrality in young adulthood was measured with a five-item version of the Multidimensional Inventory of Black Identity (MIBI) measure (Sellers et al., 1997). Sample items included “In general, being Black is an important part of my self-image; “I have a strong attachment to other Black people,” and “Being Black is an important reflection of who I am” and “I have a strong sense of belonging to Black people” (1 = strongly disagree to 5 = strongly agree;  $\alpha = 0.67$ ). Racial centrality was first assessed at Wave 5; that was the wave used in the analyses.

**Cigarette Use.**—We anticipated that racial centrality would mediate the relation between adolescent experiences of discrimination and cigarette use in adulthood; therefore, *cigarette use* was assessed at Wave 6. There were three *cigarette use* items: “how many cigarettes have you smoked in the last 3 months,” (scale: 0 = never smoked cigarettes, 1 = I have not smoked in the last 3 months, 2 = ... a few times every month, 3 = ... several times a week, 4 = ... every day, 5 = ... regularly (more than a few every day), 6 = a pack or more a day); “how much do you smoke cigarettes now,” (scale: 0 = never smoked cigarettes, 1 = never [but were a prior smoker], 2 = up to one cigarette a day, 3 = two or three cigarettes a day, 4 = up to a pack a day, 5 = more than a pack a day); and “how likely is it that you will smoke cigarettes in the next year” (scale: 1 = definitely will not, 2 = probably will not, 3 = probably will, 4 = definitely will). Cronbach’s alpha for cigarette use was  $\alpha = 0.95$ . This study did not control for substance use by the children before the experiences of racial discrimination. However, there was very little cigarette use by the participants at Wave 1; less than 1% had smoked cigarettes in the last year.

For a separate analysis of *smoking cessation*, we used the following question: “Have you ever smoked cigarettes?” The participants were coded as never smokers if they answered “No,” quitters if they answered, “I used to, but I quit” and current smokers if they answered “Yes, I still smoke.” *Relapse* was determined by identifying those participants who reported

smoking at either Wave 3 or Wave 4, then reported not smoking at Wave 5, and then reported smoking again at Wave 6. The participants who relapsed were compared to the group who had also smoked and quit, and then did *not* resume smoking at Wave 6.

The Wave 1 cigarette use of the participant's primary caregiver was used as a covariate in all of the smoking regressions and the ANOVA. They reported if they usually smoke cigarettes (scale: 0 = no and 1 = yes).

### 2.3. Analytic strategy

Bivariate correlations, regressions, logistic regressions, and ANOVAs were estimated using IBM's SPSS statistical software, version 28. Mediation was tested using the method recommended by Zhao et al. (2010), which involves estimating the 95% confidence interval of the indirect effect using bootstrap samples and concluding there is evidence of mediation if the confidence interval does not contain zero. The Process macro for SPSS was used to determine the 95% CI of the indirect effect with 5000 bootstrap samples (Hayes, 2017). Zhao et al. (2010) do not refer to "partial" or "full" mediation but instead use the terms "complementary," "competitive," and "indirect only." Specifically, they indicate that if the indirect and direct paths have the same signs, then there can be "complementary" or "indirect only" mediation, depending on whether the direct path is still significant. Zhao et al.'s (2010) "complementary" mediation is analogous to "partial" mediation and their "indirect only" mediation is a category that includes "full" mediation. They indicate that when there is "competitive" mediation, it is not possible to have full or partial mediation because the signs of the effects are opposite from each other.

The relations between racial discrimination, racial centrality, and smoking were investigated with hierarchical linear regressions. Hierarchical regressions were used to examine the improvement in model fit as variables were added. To further investigate the relation of smoking with racial centrality, we used hierarchical logistic regressions to evaluate if racial centrality had a significant association with the odds of smoking cessation and smoking relapse. Using an ANOVA, we also tested for significant differences in the level of racial centrality for participants who were current smokers compared to those who quit smoking or never smoked. The sex of the child, neighborhood racial composition, and the primary caregiver's SES and smoking status—all assessed at Wave 1—were included as covariates in the models (Hunt et al., 2007; Williams, n.d.).

## 3. Results

For all six waves used in the analyses, at least 78% of those in Wave 1 ( $N = 838$  monoracial participants) answered the questionnaire. Importantly, there were no significant differences in the mean values of the study variables between those participants who attrited versus those who remained in the study. Table 1 contains sociodemographic characteristics of the sample.

### 3.1. Bivariate associations

Table 2 displays the descriptive statistics and correlation matrix for the key measures in the study. Racial discrimination was stable over Waves 1 through 4 as indicated by relatively

consistent means at each wave (between 1.63 and 1.76) and significant correlations for each wave with any other wave ( $p$ s < .001). Racial discrimination experienced in Waves 1–4 was positively correlated with racial centrality at Wave 5:  $r(650) = 0.09$  ( $p = .02$ ). Racial discrimination at Waves 1–4 was also positively associated with cigarette use at Wave 6:  $r(655) = 0.12$ ,  $p = .002$ . However, racial centrality at Wave 5 was associated with significantly *less* cigarette use at Wave 6:  $r(597) = -0.11$  ( $p = .008$ ), and with smoking cessation at Wave 6:  $r(267) = 0.14$  ( $p = .02$ ).

### 3.2. Regression models

Hierarchical regressions demonstrated that racial discrimination was a significant predictor of racial centrality, after accounting for covariates (i.e., SES, neighborhood percent Black American, and participant sex):  $\beta = 0.16$  ( $p = .01$ ). Table 3 contains the full results. As shown in Table 4, after accounting for covariates, racial discrimination experienced in adolescence was a significant predictor of cigarette use in young adulthood before and after the addition of racial centrality to the model:  $\beta$ s = 0.21 and 0.23 ( $p$ s = .03 and .01), respectively. Racial centrality was added in the third step of the regressions and was found to be a significant negative predictor of cigarette use:  $\beta = -.14$  ( $p = .01$ ). To assess if there were neighborhood cluster effects, these regressions were also run using clustered standard errors at the Census Block Group Area level. With clustered standard errors, the effect size of the coefficients was the same and the  $p$  values changed by .01 or less.

**Mediation.**—Using bootstrapped regressions, the direct effect of racial discrimination on smoking was positive; however, the indirect effect from racial discrimination to cigarette use through racial centrality was significant and negative: indirect effect =  $-0.03$ ; 95% CI [ $-0.07$ ,  $-0.002$ ]. For the direct path, an increase in racial discrimination is associated with greater cigarette use; and for the indirect path, racial discrimination through racial centrality is associated with significantly less cigarette use. Zhao et al. (2010) defined this type of mediation, where the direct and indirect paths have opposite signs, as “competitive mediation.” With this type of mediation, the mediation is neither partial nor full mediation—the direct effect is not reduced with the addition of the mediator. While the competitive mediation does not reduce the effect size of the direct path, we have a better understanding of the different ways racial discrimination is associated with smoking. This result supports the hypothesis that racial centrality counters the negative impact of racial discrimination on later cigarette use.

### 3.3. Predicting cessation and relapse

To further examine the relation between racial centrality and smoking, three additional analyses were conducted using the same covariates as the first regression predicting cigarette use with two of those analyses shown in Table 4 and the third analysis shown in Table 5. The first two analyses were logistic regressions to predict smoking cessation and to predict smoking relapse. To predict quitting, we ran a logistic regression on the subset of the participants who reported smoking, using their racial centrality as a predictor of quitting by Wave 6. Racial centrality was a significant predictor of quitting, with a one unit increase in racial centrality associated with a 1.47 odds ratio of quitting by Wave 6 ( $p < .05$ , 95% CI [1.00, 2.16]). Next, to predict relapse, we examined the subset of participants who reported

smoking at Waves 3 or 4 and who had quit at Wave 5. For these participants, a one unit increase in racial centrality was associated with a 0.52 odds ratio of relapse at Wave 6 ( $p = .09$ , 95% CI [0.24, 1.10]). However, the power to detect an effect of racial centrality on relapse was low. Using G\*Power 3.1.9.7 to perform a sensitivity power analysis for logistic regressions and an alpha of .05, our sample size for the relapse analysis had 81% power to detect an odds ratio of 0.52, compared to our sample size for the quitting analysis for which an 81% power was associated with an odds ratio of 1.40 and which had 89% power to detect the observed odds ratio of 1.47. Lastly, as shown in Table 5, we also performed an ANOVA of racial centrality on smoking status at Wave 6. Smoking status was a significant predictor of the level of racial centrality:  $F(2, 594) = 3.56$  ( $p = .03$ ), with post hoc analysis showing that participants who currently smoke had a significantly lower level of racial centrality than participants who had never smoked and also participants who smoked in the past and quit ( $M_s = 3.75$  compared to 3.90 and 3.95, respectively,  $p_s = .02$  and  $.03$ , respectively).

To further explore the temporal effects of racial discrimination, we added racial discrimination at Wave 6 as a predictor in an additional last step for the hierarchical regressions in Tables 3 and 4. Racial discrimination at Wave 6 was not a statistically significant predictor of the outcomes in any of the regressions. Additionally, the significance and effect size of the key predictors was virtually unchanged.

#### 4. Discussion

To our knowledge, this study is the first to show that increased racial centrality mediates the association between racial discrimination experienced in adolescence and lower cigarette use in adulthood among young Black American adults. These findings suggest that a mediator that reduces risk of cigarette use in adulthood—despite experiencing racial discrimination in adolescence—is the development of Black racial centrality. These findings are consistent with prior research examining racial identity as a moderator indicating that having a strong racial identity, broadly, and, specifically, having a sense that race is an important component of their self-image and a strong attachment and sense of belonging with other Black people, is protective against the negative impact of racial discrimination on combined substance use outcomes (e.g., Clifton et al., 2021; Fuller-Rowell et al., 2012; Stock et al., 2018, 2011). Further, the fact that these effects were significant after controlling for SES is important given that, due to structural inequities, Black people in the US tend to be overrepresented among those with lower SES, and lower SES is associated with increased tobacco use (Amos et al., 2012; Karriker-Jaffe, 2013; Weinberger et al., 2021). These findings are also consistent with a previous study using the FACHS data set (Gibbons et al., 2010), that found a correlation between a measure of Black pride (developed by Smith and Brookins, 1997) and resistance efficacy, suggesting that Black adolescents who more closely identify with Black culture may be more capable of resisting social influence, especially with regard to substances. Given evidence that tobacco companies have targeted Black adolescents in their community promotions and ad campaigns (Chen et al., 2002; Yerger and Malone, 2002), this could further inform efforts at increasing resistance to cigarettes among potentially vulnerable Black adolescents and young adults. Therefore, this study furthers our understanding of the factors associated with cigarette use, and a mediator—e.g., developing stronger racial centrality—that contributes to lower risk of cigarette use in young adulthood.



This study was also the first to show that Black Americans who reported they have never smoked cigarettes in their lifetime had higher levels of racial centrality than those who reported current smoking. Importantly, our results also showed that racial centrality predicted cessation among those who had smoked at some time in their lives. In short, these findings highlight the importance of racial centrality as a protective factor against *onset* of smoking, *amount* of smoking, and it predicts *smoking cessation*.

#### 4.1. Translation

Regarding *interventions*, our results offer some support for the Strong African American Families (SAAF) program (Brody et al., 2004; M. Gerrard et al., 2006). SAAF is a culturally-informed intervention that uses social norm theory—providing information about actual prevalence of substance use across racial groups—as part of a preventive intervention for substance use. It includes informing Black adolescents that their reference group (other Black adolescents) start using substances later than White adolescents, and they (Black adolescents) also use less. The intervention has been shown to slow down the escalation of substance use that is common among adolescents in mid-teen years.

The findings from the current study, in combination with past research, further highlight the importance of positive racial socialization among Black youth to strengthen racial centrality. Racial socialization among Black youth is the process of helping youth understand what it means to be Black in America, preparing them for experiences of racism, and developing Black pride and a sense of connectedness with the Black community (Jones and Neblett, 2017). Racial socialization can take place at home through modeling and explicit conversations with caregivers. However, racial socialization can happen outside the home as well through extended relatives, peers, school, and media. Extended relatives and family friends may also share experiences of racism and serve as positive role models. Engagement in peer groups like Black fraternity and sorority organizations can further support Black pride and connectedness in the Black community. Open discussions on race and racism, racial identity exploration, and the inclusion of the accomplishments of Black people in school curricula can also support positive racial socialization and the development of racial centrality among Black youth. In addition, positive representation of Black people on the news and in television shows and movies can also support Black pride. These are a few examples of the myriad ways in which the community can support the development of racial centrality among Black youth beyond targeted drug prevention programs. As demonstrated by the findings in this study, taking steps to support strengthening racial centrality among Black youth can not only protect against the harmful effects of racism on cigarette use but also *can* support *smoking cessation* among those who develop the habit.

#### 4.2. Limitations

It is important that these findings are interpreted in the context of the limitations of the study. The focus of this study was on racial centrality, which is one component of racial identity and there are many ways in which racial identity is operationalized. In addition, this study does not inform the underlying mechanisms of the association between racial centrality and tobacco cessation. Future research should focus on understanding precisely how racial centrality supports quitting cigarette smoking. Finally, although we ran the analyses with

and without multiracial Black participants and the findings were essentially the same, the findings reported herein are based on only the participants who identified as monoracial—Black or African American. As in any study focused on racial subgroups, the fluidity of how people self-identify over time regarding race may contribute to the heterogeneity of the sample. For example, some multiracial Black people may identify as Black only and thus may report their race as such. Recent research suggests differences in substance use patterns between multiracial and monoracial Black people and stronger racial identity may not be protective against the effects of racial discrimination on substance use outcomes for multiracial people (Nalven et al., 2021). We did not find evidence that the pattern was different for the multiracial Black participants in the FACHS sample.

## 5. Conclusions

Despite the limitations of this study, there are a number of strengths to highlight. First, this study used a longitudinal sample of Black American families that included many important variables particularly salient to Black people. Given that Black people are disproportionately more likely to experience racial discrimination, the focus on Black American families allowed for understanding how racial discrimination affects cigarette use and mediators of this association. The longitudinal nature of the study provides confidence in the timing of events and insight into the impact of racial discrimination experienced in adolescence on substance use outcomes in young adulthood, which is a critical risk period for substance use and the development of substance use problems (Grant et al., 2015, 2016; Lipari and Park-Lee, 2020). In summary, this study indicated that strong Black racial centrality mediates the association between racial discrimination in adolescence and cigarette use in early adulthood, and it contributes to cigarette smoking cessation in young adulthood, highlighting racial centrality as a potentially important target for smoking prevention and reduction programs.

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## Data availability

Given the collection of genetic data, the IRB restricts the ability to share the data upon request. Please contact the Rick Gibbons at rick.gibbons@uconn.edu for more information.

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**Table 1**

Sociodemographic characteristics of sample.

Characteristics	<i>n</i>	%	<i>M</i>	<i>SD</i>	Range
Sex					
Female	454	54.2%			
Male	384	45.8%			
State					
Georgia	419	50.0%			
Iowa	419	50.0%			
Age					
W1	838		10.55	0.64	9–13
W2	739		12.63	0.73	11–15
W3	721		15.74	0.77	14–18
W4	673		18.82	0.91	16–21
W5	652		21.55	0.86	19–25
W6	660		23.59	0.88	21–26
Weekly Income in \$ W6	417		392.57	252.37	0–1750
Years of Education W6	658		12.99	1.53	11–17

Note. W1–W6 = Wave 1–6.

**Table 2**

Descriptive statistics and correlations for study variables.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Range	1	2	3
1. RD 1-4	836	1.69	.44	1-4	-		
2. RC 5	652	3.86	0.68	1-5	0.09*	-	
3. CIG 6 <sup>S</sup>	658	-0.01	0.95	-0.74-2.33	0.12***	-0.11**	-
4. QUIT	299	0.32	0.47	0 or 1	0.03	0.14*	-
5. RELAPSE	89	0.27	0.45	0 or 1	-0.04	-0.17 <sup>ψ</sup>	-

*Note.* Number at the end of the variable name indicates wave(s) of data.

For measures 1-3, higher scores indicate more of the construct.

Measures 4 and 5 are dichotomous.

Correlations not shown for measures 3-5 with each other since they are linearly dependent.

<sup>S</sup> = Standardized; RD 1-4 = Racial Discrimination averaged over Waves 1-4.

RC = Racial Centrality; CIG = Cigarette Use.

QUIT = Smoking Cessation among those who were smokers.

RELAPSE = Smoking Relapse among those who had previously smoked and then quit.

Pearson correlations using pairwise deletion; ns ranged from 599 to 657 for measures 1-3, from 269 to 299 for measure 4, and 89 for measure 5.

<sup>ψ</sup> *p* = .12

\* *p* < .05

\*\* *p* < .01

\*\*\* *p* < .001.



**Table 3**

Hierarchical regression results for racial centrality.

	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	$\beta$	<i>df</i>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup>
		<i>LL</i>	<i>UL</i>						
Step 1									
Constant	3.85	***	3.78	3.92	0.04	591	0.02	0.02	*
SES 1	0.10	**	0.03	0.17	0.03				
Neigh% Black 1	0.07	*	0.01	0.12	0.03				
Sex	0.02		-0.10	0.13	0.06				
Step 2									
Constant	3.40	***	3.31	3.78	0.12	590	0.03	0.01	*
SES 1	0.10	**	0.03	0.16	0.03				
Neigh% Black 1	0.07	*	0.02	0.13	0.03				
Sex	0.03		-0.09	0.14	0.06				
RD 1-4	0.18	**	0.05	0.31	0.07				
Step 3									
Constant	3.53	***	3.29	3.77	0.12	589	0.03	0.00	
SES 1	0.10	**	0.03	0.16	0.03				
Neigh% Black 1	0.07	*	0.02	0.13	0.03				
Sex	0.02		-0.09	0.14	0.06				
RD 1-4	0.16	*	0.01	0.32	0.08				
RD 6	0.03		-0.09	-0.14	0.06				

*Note.* CI = Confidence Interval; *LL* = lower limit; *UL* = upper limit.

Number at the end of the variable name indicates wave(s) of data.

Neigh % Black = Neighborhood % Black; Sex = 1 if male and 0 if female; RD 1-4 = Racial Discrimination averaged over waves 1-4; RC = Racial Centrality.

\* *p* < .05

\*\* *p* < .01

\*\*\* *p* < .001.

**Table 4**

Hierarchical regressions predicting cigarette use, smoking cessation and relapse.

	Cigarette Use ( <i>n</i> = 592)			Smoking Cessation ( <i>n</i> = 267)			Smoking Relapse ( <i>n</i> = 89)		
	B	SEB	exp(B)	SEB	exp(B)	SEB	exp(B)	SEB	
<b>Step 1</b>									
Constant	-0.11	*	0.05	0.47	***	0.20	0.17	***	0.41
SES 1	-0.11	*	0.05	1.44	*	0.17	0.59		0.33
Neigh% Black 1	-0.06		0.04	0.84		0.14	1.09		0.25
Sex	0.07		0.08	0.98		0.27	2.33		0.59
PC cig 1	0.19	***	0.06	0.98		0.15	4.18	*	0.56
<b>Step 2</b>									
Constant	-0.46	**	0.16	0.31	ψ	0.60	0.33		1.30
SES 1	-0.11	*	0.05	1.45	*	0.17	0.59		0.33
Neigh% Black 1	-0.05		0.04	0.84		0.14	1.09		0.26
Sex	0.08		0.08	1.00		0.28	2.28		0.59
PC cig 1	0.18	***	0.06	0.97		0.15	4.25	**	0.56
RD 1-4	0.21	*	0.09	1.27		0.32	0.68		0.73
<b>Step 3</b>									
Constant	0.02		0.26	0.08	**	0.93	5.25		2.05
SES 1	-0.10	*	0.05	1.38	ψ	0.17	0.57		0.34
Neigh% Black 1	-0.04		0.04	0.82		0.14	1.20		0.27
Sex	0.08		0.08	0.96		0.28	2.34		0.61
PC cig 1	0.18	**	0.06	0.98		0.15	4.40	*	0.58
RD 1-4	0.23	*	0.09	1.18		0.33	0.57		0.75
RC 5	-0.14	*	0.06	1.47	*	0.20	0.52	ψ	0.39
<b>Step 4</b>									
Constant	0.00		0.26	0.08	**	0.93	5.82		2.07
SES 1	-0.10	*	0.05	1.39	ψ	0.17	0.52	ψ	0.37
Neigh% Black 1	-0.04		0.04	0.82		0.14	1.26		0.27
Sex	0.07		0.08	0.96		0.28	2.56		0.63

	Cigarette Use ( <i>n</i> = 592)		Smoking Cessation ( <i>n</i> = 267) <sup>#</sup>		Smoking Relapse ( <i>n</i> = 89) <sup>#</sup>	
	B	SEB	exp(B)	SE B	exp(B)	SEB
PC cig 1	0.17	**	0.06	0.15	5.28	**
RD 1-4	0.18	ψ	0.11	0.37	1.17	0.88
RC 5	-0.14	*	0.06	0.20	0.51	ψ
RD 6	0.08		0.08	0.28	0.40	0.62

Note. Number at the end of the variable name indicates wave(s) of data.

<sup>#</sup> Logistic Regression, showing the odds ratio for each predictor = exp((B).

Neigh % Black = Neighborhood % Black; Sex = 1 if male and 0 if female; PC cig = Primary Caregiver smokes cigarettes where 1 = yes and 0 = no; RD 1-4 = Racial Discrimination averaged over Waves 1-4; RC = Racial Centrality.

ψ *p* < .09

\* *p* < .05

\*\* *p* < .01

\*\*\* *p* < .001.

**Table 5**

Means, standard deviations, and post hoc test for an analysis of variance of racial centrality.

Wave 6 Smoking Status	<i>n</i>	<i>M</i> <sup>a</sup>	<i>SD</i>	Post Hoc Multiple Comparisons <sup>b</sup>				
				<i>M minus M of Current Smokers</i>	SE	95% CI		
						LL	UL	
1. Never Smoked	326	3.90	0.66	0.15	*	0.06	0.02	0.27
2. Smoked but Quit	85	3.95	0.71	0.20	*	0.09	0.02	0.37
3. Currently Smoke	182	3.75	0.71					

Note. CI = Confidence Interval; LL = lower limit; UL = upper limit.

A sensitivity power analysis was performed using G\*Power 3.1.9.7 and an alpha of .05. The sample size for the comparison of the never smokers to the current smokers had a power of 80% to detect an effect size of 0.23 and 50% to detect an effect size of 0.15. For the comparison of the smoked but quit to the current smokers, there was 80% power to detect an effect size of 0.33 and 45% power to detect an effect size of 0.20.

Comparison of the Never Smokers to those who Smoked but Quit is not shown since the difference was not significant (95% CI = [-0.21, 0.11],  $p = .55$ ).

\*  $p < .05$ .

<sup>a</sup> Means adjusted for covariates SES, Neighborhood % Black, Sex, Primary Caregiver smoking status, and Racial Discrimination averaged over Waves 1–4 and at Wave 6.

<sup>b</sup> Racial centrality was significantly different by status ( $F(2, 594) = 3.56, p = .03$ ).